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Part 2 Comments and Responses
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PRELIMINARY FINAL
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM

DECEMBER 10, 1982

Prepared By:
Bureau of Land Management
Craig District
White River Resource Area
Oil Shale Projects Team
Meeker, Colorado

PART 2 -- COMMENTS ON THE DRAFT EIS, AND RESPONSES TO COMMENTS

Part 2 of the Final EIS includes a copy of all the written comments on the Draft EIS, oral testimony presented at the public hearings held in Denver (August 24, 1982), Meeker (August 25, 1982) and Grand Junction (August 26, 1982), Colorado, and responses to those comments. Each individual comment that appears in Section A, Comments on the Draft EIS, has been bracketed, and a number assigned to it that corresponds to a response listed in Section B, Responses to Comments, immediately following the comments. If a particular comment is simply an observation or is in agreement with the text, no response has been made.

A. Comments on the Draft EIS

The letters appear in the order they were received by the Oil Shale Projects Team. Following the letters, are the public hearing transcripts in the order the hearings were held. To reduce the total volume of reprinted materials in the text, extensive attachments to some comment letters that do not raise specific issues have not been included. Also, the public hearing transcripts that are reprinted only include that portion where comments were made on the Draft EIS. Those portions of the letters and the transcripts that have not been reprinted are available for public review in the BLM White River Resource Area Office in Meeker, Colorado, and in the BLM Colorado State Office in Denver, Colorado.

For ease of reference, the letters have been listed below according to source. The letter number refers to the number in the upper right hand corner of each comment letter.

Federal AgenciesLetter Number

Department of Interior

U.S. Fish and Wildlife Service (Biological Assessment Review)	1
U.S. Fish and Wildlife Service	8
National Park Service	18
Bureau of Reclamation	35
Minerals Management Service	45
U.S. Geological Survey	51

Department of Energy 40

Western Area Power Administration	7
-----------------------------------	---

Department of Transportation - Federal Highway Administration 9

Environmental Protection Agency 53

Colorado State Agencies

Department of Natural Resources	46
Colorado Natural Areas Program	46a
Mined Land Reclamation Division	46b
Division of Wildlife	46c
Colorado Geological Survey	46i
Department of Agriculture	46d
Department of Education	46e
Department of Health	46f
Colorado Historical Society	46h
Department of Highways	46j
Division of Water Resources	46k

Local Government Agencies

Pitkin County	19
Rio Blanco County	27
Garfield County	28
Associated Governments of Northwest Colorado	31

Environmental and Public Interest Organizations

Colorado Mountain Club	17
Environmental Defense Fund	39
Friends of the Earth	38
Garfield County Citizens Association	43
League of Women Voters of Colorado	33
National Audubon Society	13
National Wildlife Federation	37

Public Institutions

Pioneers Hospital	36
University of Colorado	41
Washington State University	10

Professional Consultants

Robert E. Chancellor	2
J. Phyllis Fox Consulting Services	42
Geothermal Surveys, Inc.	30
Stearns-Roger Engineering Corporation	4

Industry and Industrial Associations

American Petroleum Institute and American Mining Congress	52
Cathedral Bluffs Shale Oil Company	29
Chevron Shale Oil Company	21
Cities Service Company	22
Colorado-Ute Electric Association, Inc.	20
Industrial Resources, Inc.	5 and 6
Mobil Mining and Coal Division	48
Multi Mineral Corporation	15
Rio Blanco Oil Shale Company	50
Rocky Mountain Oil and Gas Association	44
Shell Oil Company	23
Sohio Shale Oil Company	47
Union Energy Mining Division	49

Individuals

Ginny Aragon	16
Elisa Dancing Bird, et al	24
Carol Green	11
Gregory J. Gustafson	12
Jeanne T. Hemphill	14
Barton Hibbard	25
David Schein	34
Lillian Valenzuela	32
Thelma Zabel	26

Public Hearings

Denver - August 24, 1982	D
Meeker - August 25, 1982	M
Grand Junction - August 26, 1982	G



United States Department of the Interior

FISH AND WILDLIFE SERVICE
ENDANGERED SPECIES OFFICE
1406 Federal Building
125 South State Street
Salt Lake City, UT 84138
16 July 1982

RECEIVED
1982 JUL 21 AM 11:40
BUREAU OF LAND MGMT.
WHITE RIVER N.A.
MEEKER, CO. 81541

IN REPLY REFER TO:

MEMORANDUM

TO: Area Manager, Meeker Resource Area,
U. S. Bureau of Land Management, Meeker, Colorado

FROM: *Acting*
Project Leader, Endangered Species Office,
U. S. Fish and Wildlife Service, Salt Lake City, Utah

SUBJECT: Review of Biological Assessment - Two Proposed Prototype Oil Shale
Base Tracts (C-11 and C-18)

In response to your 21 April 1982 biological assessment and request for informal Section 7 consultation. The Fish and Wildlife Service (FWS) is providing you this review of your assessment.

BIOLOGICAL ASSESSMENT REVIEW

NON-AQUATIC SPECIES

The proposed oil shale energy projects on prototype oil shale base tracts C-11 and C-18 is not expected to affect the black-footed ferret (Mustela nigripes), bald eagle (Haliaeetus leucocephalus), peregrine falcon (Falco peregrinus), and the whooping crane (Grus americana).

AQUATIC SPECIES

Due to uncertainties as to the size of the proposed oil shale operation and the specific technology to be used the Bureau of Land Management (BLM) is at present unable to accurately forecast the size of water depletion from the White River, if any. Section 7 Interagency consultation will have to be reinitiated when BLM receives detailed development plans from prospective developers. The FWS therefore defers its biological assessment review on the Colorado squawfish (Ptychocheilus lucius), and the humpback chub (Gila cypha) until the future lessee submits its preliminary development plan to the BLM and its detailed development plan to the Minerals Management Service as discussed in the biological assessment.

PROJECT DESCRIPTION

Lease, for multi-mineral recovery of oil shale, nahcolite and dawsonite, two tracts of 5118 acres each in the Piceance Basin, Rio Blanco County, Colorado. Included in the lease are tracts C-11 and C-18 approximately 20 miles southwest of Meeker, Colorado. Four leasing alternatives are: 1) lease both tracts; 2) lease tract C-11 only; 3) lease tract C-18 only; or 4) lease neither tract. Mining technologies most likely will include one of the following three: 1) Direct Mining and Surface Retorting; 2) Mine Assisted In-Situ; or 3) True In-Situ. Water use will be primarily dependent on the process selected for

development the oil shale deposit. It is expected that most of the water needed for mining and processing will be generated on tract from groundwater. As much as 4,620 acre-feet/year may be required from the White River.

BASIS OF REVIEW

NON-AQUATIC SPECIES

The FWS concurs with the biological assessment prepared by the BLM, dated 21 April 1982 for the black-footed ferret, bald eagle, peregrine falcon, and whooping crane. The project is not expected to have an effect on these four species.

AQUATIC SPECIES

Colorado squawfish and humpback chub were once abundant throughout the Colorado River System from the Gulf of California to southwestern Wyoming. Presently, the squawfish is limited to the upper mainstem and its major tributaries of the Colorado River System. The humpback chub is found only in limited areas within the river system in Colorado, Utah, and Arizona. The primary cause of decline for these fish species is human alteration and degradation of the river environment. Major impoundments and water diversions have depleted water supplies and altered the temperatures, turbidity, salinity, and flows of the stream, thus reducing habitat for endemic fishes.

There are three major interacting factors that explain in major part the present status of the endemic species of the Colorado River Basin. These are: 1) reservoirs; 2) diversions of water from the Basin for various uses; and 3) environmental changes in the river brought about by 1) and 2).

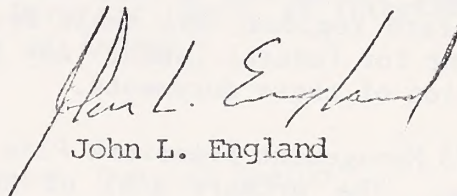
The most obvious and clearly identifiable factor contributing to the decline of native species is the large dams and reservoirs that converted hundreds of miles of river habitat into great impoundments. Prior to the listing of the endangered fishes, the preservation of these fishes was not considered in the planning and operation of these projects. It has been determined that Colorado squawfish, humpback chub, and bonytail chub do not reproduce successfully in large reservoirs. The alterations resulting from the large dams changed a river of great extremes of flow, temperature, and turbidity into a series of reservoirs discharging cold, clear water at a relatively constant rate of flow and temperature. Since the native fishes' life stage requirements are based on the natural river conditions, they could not adapt to the changed conditions, and populations rapidly declined. The adults present in the river when a dam is constructed may continue to live in a reservoir and may thrive and grow, but the populations consist of fewer, larger, and older fish each successive year until they all die of old age or other causes.

Water depletions both directly by diversion and indirect by consumption and evaporation from the Colorado River Basin have drastically altered flow patterns, water quality parameters, river channel characteristics, and have contributed to the elimination and alternation of the quiet backwater nursery areas for many of the endemic Colorado River fish species. For the Colorado squawfish much essential habitat is no longer present. There is general agreement among Federal and State biologists studying endangered fishes of the Upper Colorado that the natural flow regime of high spring and early summer flows followed by a gradual period of decreasing summer flows are beneficial to Colorado squawfish and humpback chub reproduction.

A less important cause of decline may be the increased number of exotic fishes, but this increase in exotics also is a function of habitat changes. Although correlations exist between declining native fish populations and increasing populations of exotic fish, cause and effect are not fully understood. The evidence of harmful effects of non-native species on the endangered Colorado River fishes is largely circumstantial. However, there is no doubt that fewer exotic fishes would be present if the river more closely resembled its natural state.

To increase knowledge of the Colorado River endemic fishes' (primarily the listed endangered species) habitat requirements, a Colorado River Fishery Project (CRFP) team was established in April 1979. This team is staffed with FWS personnel and has funding from the FWS, Bureau of Reclamation (BR), and the BLM. Other participants are the Utah Division of Wildlife Resources and the Colorado Division of Wildlife. Major objectives of the team's study were to learn additional life history requirements of the listed fishes. Under our funding agreement with BR and BLM, most of the field work was in the Green and Colorado Rivers where impacts from BR and BLM projects are the greatest. Information obtained during the study via field, laboratory and hatchery work has made it possible to provide recommendations to maintain and develop more favorable habitat for the listed fishes. As a result of the CRFP study the FWS has determined that the Colorado squawfish and humpback chub are experiencing declines in their present habitat and without active reclamation action will become extinct. Any further degradation of their environment such as water depletion will likely accelerate the extinction of these species if not properly offset by active conservation measures.

As new information becomes available concerning this project the FWS encourages the BLM to re-enter Section 7 consultation under the Endangered Species Act in order to resolve any conflicts involving water needs for oil shale development and maintaining endangered Colorado River fishes. We appreciate your interest in conserving endangered species.


John L. England

2

ROBERT E. CHANCELLOR

CONSULTING GEOLOGIST
A.I.P.G. - A.A.P.G.

Suite 2000
718 - 17th Street
DENVER, COLORADO 80202
303-292-1350

July 21, 1982

P. O. BOX 706
BRECKENRIDGE
COLORADO 80424

Oil Shale Projects Leader
White River Resource Area
P. O. Box 928
Meeker, Colorado 81641

RE: Comments on the Draft Supplemental Environmental Impact
Statement for the Prototype Oil Shale Leasing Program

Dear Sir:

The preparers of subject document should be highly commended for the consistently excellent quality of its content. More important, they deserve the deep appreciation of all parties interested in oil shale development. The work brings together and judiciously summarizes a large body of diverse data regarding oil shale. The even handed clarity of the document is exemplary of the work that will be necessary if the federal government is to ever evolve a proper long term policy to guide its oil shale endeavors. This book will be required reading for anyone involved in any aspect of oil shale.

The unavoidable conclusion to be reached from a study of the document is that it would not be in the public interest to lease any more public lands for oil shale development at this time. The basic reason for this conclusion is that although leasing of the proposed tracts is in conformance with an existing Management Framework Plan of 1973 vintage, the 1973 Management Framework Plan is admittedly outdated and should absolutely not be used in reaching further decisions on oil shale leasing.

As stated, the Bureau of Land Management is in the process of developing a long term regional oil shale leasing program and Environmental Impact Statement for Federal Lands. Any future leasing must key to the final completion of these documents.

The 1973 Management Framework Plan is unquestionably flawed in a variety of ways. The primary goal of the prototype program was "to provide a new source of energy to the nation by stimulating the development of commercial oil shale technology by private industry." After almost ten years this is simply not being accomplished by the prototype program.

If we really want the government to help private industry achieve near future commercial scale multi-mineral extraction -- rather than playing politics, wouldn't we logically accelerate work at the existing Horse Draw facility? Maybe that's the kind of recommendation that will come out of the highly important updated Management Framework Plan study. Maybe that's what worries the sponsors of this latest hurry-up leasing plan.

Oil Shale Projects Leader

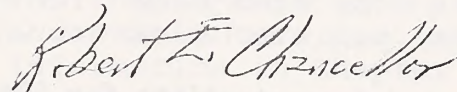
July 21, 1982

Page Two

In fact, the subject document inadvertently supplies many of the reasons for the failure of the original prototype leasing program. The proposed leases are about six miles equidistant from Tracts C-a and C-b. Mining on the proposed leases would be much more complicated than it is on C-b. There are a bunch of laid off miners who will confirm that C-b has yet to solve its mining problems.

In philosophic summation, this admirable Environmental Impact Statement tells the perceptive Decision Maker - "If you want to create more unnecessary conflicts with oil and gas development, gas pipelines and ranching, by starting another speculative project in an area where two other similar government sponsored projects are already in deep trouble - using a faulty, outdated document to justify your decision, then go right ahead. That would be right in line with the old oil shale tradition. It won't screw things up much more than they're already screwed up. But don't ever say we didn't lay all the facts in front of you."

Sincerely yours,



ROBERT E. CHANCELLOR

cc: Senator William L. Armstrong
Senator Gary W. Hart
Congresswoman Patricia Schroeder
Congressman Timothy E. Wirth
Congressman Ray Kogovsek
Congressman Ken Kramer
Congressman Hank Brown
Governor Richard Lamm
Mr. James R. Rollo, Office of the Director, Dept. of Interior
Mr. Charles F. Metzger, U. S. Dept. of Energy
Mr. Bob Burford, Director - BLM
Captain G. R. Gilmore, CEC, USN
Mr. Hillary A. Oden, USGS
Mr. John Trippe, Conservation Manager, Central Region
Mr. Frank A. Salwerowicz, Deputy Conservation Manager, Central Region
Mr. Edgar W. Guynn, District Supervisor
Mr. John L. Price, District Supervisor
Mr. Peter A. Rutledge, Area Oil Shale Supervisor
Mr. B. Curtis Smith, Area Manager, BLM
Oil Shale Environmental Advisory Panel, Attn: Mr. Henry O. Ash
Mr. Roger Williams, Regional Administrator, EPA
Mr. Steve Schmitz, Colorado State Energy Impact Coordinator
Mr. Kevin Markey
Mr. David A. Coppedge, Sun Gas Company
Mr. Joe H. Crosby, CSG Exploration Company
Mr. Jon Rex Jones, Jones Company
Editor, The Daily Sentinel, Grand Junction
Mr. Dick Martin, Carbondale, Co.
Mr. William Brennan, Rifle, Co.



July 26, 1982

Oil Shale Projects Team Leader
Bureau of Land Management
White River Resource Area
P.O. Box 928
Meeker, CO 81641

Re: DEIS for the Prototype Oil Shale Leasing Program

On page 4 of the Summary regarding air quality impacts of the No Action Alternative, your conclusions are completely misleading!

The estimated concentrations for SO₂, TSP, and NO_x at Rifle, as a result of the private oil shale development predicted for the area west of Rifle, are entirely unrealistic. Under current federal and Colorado law, such dangerously-high concentration levels are illegal and would not be allowed. It is totally inconceivable that both Congress and the Colorado Legislature would relax the existing air quality standards to such health-threatening levels, except possibly during emergency situations such as complete cessation of foreign oil imports or war time.

The proper and correct analysis of air quality impacts under the No Action Alternative is to assume that no illegal facilities would be permitted. Thus, the highest concentrations that would be allowed would not exceed the PSD increments for SO₂ or TSP or the NAAQS for NO_x. Any other impact assessment to the contrary is improper and incorrect.

If I were a resident of Rifle and saw these predicted concentration levels, I would be scared to death.

Sincerely,

STEARNS-ROGER ENGINEERING CORPORATION

Don S. Packnett, CCM
Staff Meteorologist
Environmental Sciences Division

DSP/liz/1545h

INDUSTRIAL RESOURCES, INC.

1101 WEST 6TH AVE. SUITE 301

DENVER, COLORADO 80215

AREA CODE 303/232-2942

July 26, 1982

Mr. John Singlaub
Oil Shale Projects Team Leader
Bureau of Land Management
White River Resource Area
P. O. Box 928
Meeker, Colorado 81641

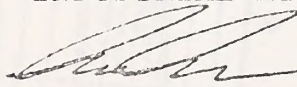
Dear John: RE: Draft Supplemental Environmental Impact
Statement for the Prototype Oil Shale
Leasing Program

There is an apparent problem in correlating the shale oil, nahcolite, and dawsonite resource data. In Chapter II, pages 35 and 38 tabulate the resource losses for Tracts C-11 and C-18 under various extraction scenarios. When this data is recalculated in the minerals industry acceptable term, i.e., recoverable resources, and compared to the information in Chapter III, pages 63 and 64, there are some significant discrepancies. For example, one would be on Tract C-18. By calculation the recoverable shale oil resource for direct mining and surface retorting amounts to 1.638 billion bbls. in Chapter II, while in Chapter III it is stated to be 2.297 billion bbls. I am certain these differences were a result of the short time limitations imposed on compiling this complex document along with the continuous submittal of revised information during the compilation.

Unless there is some unapparent reasoning, I believe the overall percentage recovery factors should be quite similar for both tracts. Probably a somewhat lower recovery should be applied to Tract C-11 because of the adverse local mining conditions that would result from the effects of Dudley Bluffs Graben. Again when the percentage recoveries for shale oil are calculated from pages 63 and 64 for both Tracts under the direct mining scenario, the recoveries are 28.2% for Tract C-11 and 22.4% for Tract C-18. This is a significant difference.

I am assuming the various discrepancies will be corrected in the final draft.

Very truly yours,
INDUSTRIAL RESOURCES, INC.


Edward C. Rosar
President

ECR:cr

cc: Mr. Arthur S. Bowes, Jr.

INDUSTRIAL RESOURCES, INC.
1101 WEST 6TH AVE. SUITE 100
DENVER, COLORADO 80202

AREA CODE 303/232-2942

July 29, 1982

Mr. John Singlaub
Bureau of Land Management
White River Resource Area
P. O. Box 928
Meeker, Colorado 81641

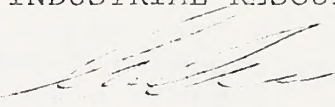
Dear John: RE: Draft Supplemental EIS for Prototype
Oil Shale Leasing Program

On page 98, column 2, para. 4, a statement is made...
"Approximately 4840 acres of Tract C-18 is currently being
leased to Wolf Ridge Corporation for the mining of sodium".
Please check this acreage again and advise me if this is
correct.

In my letter dated July 26, 1982, I discussed the problem
of correlating the resource estimates and recoveries for
Tracts C-11 and C-18. In this letter I failed to mention that
Table IV-5, page 125 should be corrected accordingly.

Sincerely yours,

INDUSTRIAL RESOURCES, INC.


Edward C. Rosar
President

ECR:cr

cc: Mr. Arthur S. Bowes, Jr.

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FROM	MR. ROSAR
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7
JUL 30 1982

Department Of Energy

Western Area Power Administration
P.O. Box 11606
Salt Lake City, Utah 84147

In Reply
Refer to: L2130

Mr. John Singlaub
Team Leader
Bureau of Land Management
White River Resource Area
317 East Market Street
P.O. Box 928
Meeker, CO 81641

Dear Mr. Singlaub:

We acknowledge the receipt of the Draft Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program and appreciate the opportunity to review and respond to its content. At this time, we do not see any problems with, nor have any objections to, the draft but would appreciate your continued cooperation relative to coordinating Western Area Power Administration's future transmission activity with the oil shale leasing program.

Please advise if you have any questions.

Sincerely,

Lloyd D. Nelson
Lloyd D. Nelson
Assistant Area Manager
for Engineering

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

ENDANGERED SPECIES OFFICE
1406 Federal Building
125 S. State St.
Salt Lake City, Utah 84138

1982 AUG -S -11 10:16

BUREAU OF LAND MGMT.
WHITE RIVER PL.
MEER, CO. 81641

IN REPLY REFER TO:

9 August 1982

MEMORANDUM

TO: Area Manager, Meeker Resource Area,
U. S. Bureau of Land Management, Meeker, Colorado

FROM: Project Leader, Endangered Species Office,
U. S. Fish and Wildlife Service, Salt Lake City, Utah

SUBJECT: Prototype Oil Shale Leasing Program (C-11 and C-18) Supple-
mental DEIS

We have received the subject DEIS and have reviewed the relevant portions pertaining to endangered species. We refer you to our review of your biological assessment dated 16 July 1982 sent to your office. We would expect that consultation under the Endangered Species Act would be necessary if the proposed oil shale project alters the flow or water quality of the White River. Ecological Services of the Fish and Wildlife Service may correspond separately concerning other wildlife values.

(3)

Please note our new address above.

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Bureau of Land Management Meeker, Colorado			
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Fred L. Bolwahn

Fred L. Bolwahn

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DIVISION OF LABOR RELATIONS
 WASHINGTON, D. C.
 1971

HEP-08

Dear Mr. Singlaub:

Thank you for the opportunity to review the Draft Supplemental EIS for the Prototype Oil Shale Leasing Program. We find the DSEIS provides a very thorough analysis of potential impacts for the alternatives studied.

Although the DSEIS indicates close interagency coordination, which is essential for successful development of the program; there is no indication of formal coordination with the Colorado Department of Highways or the Department of Interior's Oil Shale Environmental Advisory Panel. Since there will be quite heavy impacts on the highway systems in the project area, we would suggest that you coordinate this document and continue a close working relationship with the Colorado Highway Department. As well, the Oil Shale Environmental Advisory Panel was established to assist the Secretary of the Interior on projects such as this. Again, we would suggest close coordination with this group.

Sincerely,

Fred Hempel

Fred Hempel
Director, Environmental Programs

[illegible]

PULLMAN, WASHINGTON 99164-4006

DEPARTMENT OF SOCIOLOGY/DEPARTMENT OF RURAL SOCIOLOGY
Room 23, Wilson Hall

[illegible]

Subject: Socio-cultural impacts of the Prototype Oil Shale Leasing Program:
Technical review of the Draft Supplemental Environmental Impact Statement.

This review concerns the Draft Supplemental Environmental Impact Statement (dEIS) for the Prototype Oil Shale Leasing Program. The comments focus primarily on this document's assessment of likely social impacts. Before the criticisms are offered, however, it is appropriate to note two particularly praiseworthy aspects of this dEIS.

While this dEIS is not perfect, it is notable for its clarity. Clear writing is a rare commodity in EISs, and the team that put this dEIS together deserve high praise for their efforts to write in English instead of jargon. Further room for improvement still is possible, of course; the editors appear to have paid more attention to the early, introductory sections of the dEIS than to the later, more detailed technical discussions, for example, and the use of "impacted" (as a verb and an adjective), apparently crept into this dEIS despite careful editing otherwise. Even so, this document is so clearly above average in its intelligibility that special recognition is warranted. Its clarity is in the top 10 percent of all the EISs I have read. In terms of compliance with the letter and the spirit of the Council on Environmental Quality's regulations for implementing the procedural provisions of the National Environmental Policy Act (particularly 40 CFR 1500), this is without a doubt the best dEIS I have read in the last year and a half. The CEQ regulations note that the purpose of an environmental impact statement is to provide a decision-maker with information--doing so accurately, clearly, and dispassionately--rather than to spill a sea of defensive jargon across so many pages that the relevant information is effectively hidden from public view. I hope other writers of EISs will follow your lead.

The second praiseworthy point has to do with the document's clarity of thinking in the area of analysis that is the focus of this review. The document

focuses upon "social impacts" as social ones--rather than assuming or asserting that they have somehow been "covered" in the process of dealing with economic impacts or esthetic concerns. In fact, as social scientists have been noting for more than half a decade, the social impacts of major developments often differ systematically from the economic impacts as well as from the esthetic impacts. By dealing with the social impacts directly, this dEIS has taken a significant step toward complying with the CEQ regulations that EISs contain "accurate scientific analysis" (40 CFR 1500) and that EISs discuss the social as well as the economic and physical environmental effects (40 CFR 1508). Moreover, this particular analysis appears to have been written by professionals who have a reasonably accurate comprehension of the social character of the region.

While praise is deserved on both of these points, however, the dEIS still has important weaknesses. One of them is understandable--at least at present--but absolutely unacceptable within the Regulations' call for "accurate scientific information." The "baseline" conditions used in this dEIS are totally without professional credibility. They call for massive growth in the study region; in fact, it is now widely known that stability, or even decline, is the more likely condition. It is not enough for the document to say obliquely that the decision-maker "should consider" the fact that the baseline projections are now known to be inaccurate (and dramatically so). The NEPA regulations say clearly (40 CFR 1500) that EISs are required to present scientifically accurate evidence to the decision-maker--who, after all, cannot be expected to have the expertise to be able to comprehend the full social science significance of the error. (This problem is particularly severe in the case of the social impacts; its relevance to other types of impacts is for others to judge.)

It is now widely known that the Colony project has been shut down, and virtually all other oil shale development activity in the area is at a standstill. Even area coal mines are now laying off workers--with an important recent example being the shut-down of the Rineau No. 2 mine near Meeker. In fact, the most reasonable assessment at present is that area communities (including Rifle, and particularly including Meeker) will be in a period of stability or perhaps even slight decline, rather than in a period of extremely rapid growth, as the "baseline" condition. Since all impacts are compared against the baseline condition, the present document would effectively provide the decisionmaker with systematically erroneous information--and with information that is known to be erroneous. The proposed leasing could indeed lead to boom conditions both in Rifle and in Meeker, but it would do so against a baseline of stability, rather than of pre-existing growth, and a long series of expected impacts will therefore be significantly different from what is projected in the current draft of the EIS. It is unfortunate that many of these recent developments took place after work on the dEIS began, but they have taken place, and the Regulations make it clear that they must be taken into account.

The remaining comments focus on more specific details of the social impact analysis. Most importantly, with regard to Table IV-18, there appears to be a growing consensus among social scientists that a simple listing of "+/-/0" is not an appropriate one, at least as a way of conveying information on social impacts. The compactness of this table is commendable, and it appears that your social scientists have put a good deal of thought into it, but the general rule would seem to apply here as well, for three reasons. First of

all, the NEPA regulations clearly say that the EIS is meant to convey information on significant impacts; a simple +/- listing does not convey any information on significance to the decisionmaker. Second, a +/- listing does not give the decisionmaker relevant information on what is actually likely to happen (a prose description, whatever its drawbacks, can at least give the decisionmaker enough information that he/she is able to come up with his/her own assessment of how significant that outcome is likely to be). Third, and most importantly, a simple +/- listing does not provide the needed information on the reasoning that has been employed in developing the positive and/or negative information. (While many of the entries in Table IV-18 appear quite reasonable, some of the judgments do not appear to be consistent with existing evidence--for example, the best available evidence strongly indicates that young persons in booming communities experience substantial psychological stress, and that report their opportunities for interaction to be significantly negative. (See the evidence summarized in Freudenburg, 1982). The table currently lists psychological well-being for the youth as "+ -" and lists the interaction opportunities as "+"; your social scientist(s) presumably had a rationale for these decisions, but if so, the reasoning employed (and the reasons for not drawing instead from the best available quantitative evidence) should be clearly stated.

(5)

A number of other, more minor suggestions can be offered. One is that, as suggested earlier, the editing job in the technical social science sections of the document does not appear to have been as careful as in the earlier pages. There seem to be a number of cases where words and/or punctuation have been omitted, changing the meaning or impairing the clarity of the discussion.

(6)

Another is that some of the statements need to be qualified--e.g., on p. 159: "with full operation, social structural and social psychological changes will also slow to an acceptable, comfortable pace because of this population leveling" (emphasis added). This conclusion is plausible, but it represents conjecture rather than research findings, and thus it needs to be more carefully qualified.

(2)

The dEIS is impressively accurate in noting that differences between long-time residents and construction workers are not nearly as stark as they are often expected to be, and it is quite refreshing to see EIS writers who have enough familiarity with the relevant sociological data to be aware of this point. Even so, there appear to be a number of social changes taking place in boomtowns that are not related to differences between oldtimers and newcomers, but which are rather related to basic social structural changes, and to other increases in stress levels that are taking place. These latter impacts need to be more fully discussed, particularly because the best available evidence suggests that they are caused by the rate of growth per se--a point that has obvious relevance to mitigating (as well as assessing) the impacts.

(5)

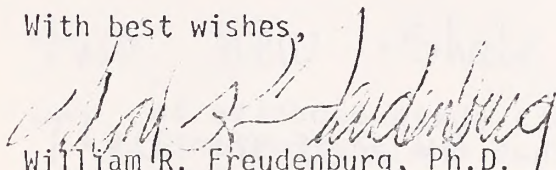
While these are points that need to be improved, however, it is important to note again the significance (and praiseworthiness) of having an explicit discussion of social impacts included in the dEIS. This discussion provides an important foundation for the necessary improvements. (The far more common error is for EISs to omit such discussions entirely--a procedure which, as noted earlier, is in open conflict with relevant NEPA regulations.) The present EIS has made significant strides toward complying fully with the

spirit and the letter of the relevant regulations, and it is to be hoped that future EISs will follow its example in that respect.

REFERENCE

William R. Freudenburg, 1982. "The Impacts of Rapid Growth on the Social and Personal Well-Being of Local Community Residents." Pp. 137-170 in Bruce A. Weber and Robert E. Howell, eds., Coping with Rapid Growth in Rural Communities. Westview Press, Boulder, CO.

With best wishes,


William R. Freudenburg, Ph.D.
Director, Washington State Project on
Social Impacts of Community Change

WRF:gb

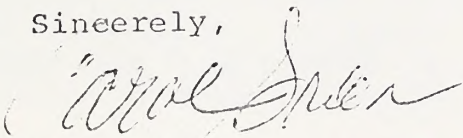
11
Carol Green,
4207 S. Hudson Pkwy.,
Englewood, Co. 80110

August 25, 1982

Oil Team Projects Leader,
BLM; White River Resource Area,
P.O. Box 928
Meeker, Colorado

I am writing about the leasing of oil shale deposits in the western slope area. I believe that the environment is important, but it must be taken in perspective. As long as reasonable safeguards are in place, it is important to make job opportunities available for the people of the western slope. They were badly hurt by Exxon's pullout. Let's keep their interests high in the decision making process.

Sincerely,


Carol Green

12
Aug. 25, 1982

Dear BLM Oil Projects Team Leader:

I feel very strongly that your agency should not give out the two new Shale Leases north of Rifle. These massive projects, and their shale retort process will disrupt the water supply; specifically the two key aquifers in the area. In addition, the ensuing sulfur dioxide, and nitrogen oxides emitted from the shale processing and its accompanying growth will seriously pollute one of our great western treasures - clean, clear air. The prevailing winds will carry this fouled air to the high country, where the snowpack is so essential for Front Range water supplies! I strongly call on your Bureau to deny these permits to an industry beset with -economic, and

environmental problems! Thank you

Cordially yours,

Mr. Gregory J. Gustafson
2439 14th Ave. Ct.
Greeley, Co 80631



National Audubon Society

August 25, 1982 4150 DARLEY, SUITE 5, BOULDER, COLORADO 80308 (303) 499-5409

Mr. John Singlaub
Bureau of Land Management
White River Resource Area
P. O. Box 928
Meeker, CO 81641

Dear John:

The National Audubon Society would like to submit the following as a supplement to comments made at public hearings August 24, 1982, in Denver, on the Draft Supplemental EIS for the Prototype Oil Shale Leasing Program.

Our first concern is that the EIS fails to address potential acid precipitation impacts. In the eastern United States, these impacts have included the acidification of lakes, elimination of fish populations, decreases in salamander reproduction, declines in fish-eating bird species, and declines in other aquatic species populations. Acid precipitation also increases the mobilization of heavy metal ions in affected ecosystems, with toxic effects elsewhere. Given these impacts, and the importance of recreational fishing in the Flattops and Mt. Zirkel Wilderness Areas east of the Piceance Basin, we feel the potential for acid precipitation should receive thorough discussion. (7)

Our second concern is that the range of alternatives considered in the EIS is too narrow. At a minimum, the alternatives should include development of other sources of energy - such as the natural gas deposits present - alternative leasing sites, and alternative control technologies available. It has become quite apparent from the events of the last six months that oil shale will not be developed as a replacement for imported oil while substantial oil supplies last - especially not when prices fall and there is a glut on the international market, as now. Rather, interested firms will develop oil shale, if at all, when conventional oil supplies have become scarce and prices are high. Oil shale actually holds less promise of eliminating the U.S. dependence on imported oil than solar, wind, hydropower, increased natural gas use, or coal, for which proven technologies are available. Therefore, we feel that development of alternative energy sources in the Piceance Basin needs attention. (8)

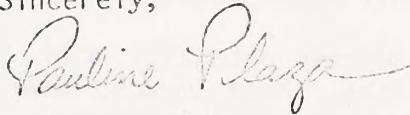
Thirdly, the EIS bestows little attention on air quality impacts for the Class I areas near the Piceance - Flattops, Maroon Bells, and Mt. Zirkel Wilderness Areas - other than to list 24-hour predicted pollutant concentrations. The effects on visual resources in these and primitive Class II areas are not covered at all. We stress that such lands, and the scenic vistas they offer, are a priceless resource. The EIS should clearly state what kinds of visual impacts additional oil shale development could have on these areas. (9)

(page 2)

The EIS does, however, suggest an answer to the whole question of whether or not more prototype leases should be offered at all. Judging by the data herein, that answer is no. Impacts from development of either Tract C-11 or C-18, or both, will contribute additional environmental and social damage to a region already reeling from development by private interests on private lands. We also note that development of the first two prototype leases remains incomplete, and the data that were to proceed from operations there are likewise incomplete. Given this situation, we cannot believe that further leasing of federal tracts is either wise or necessary at this time.

I would like to congratulate the Bureau on a generally very readable and well-organized EIS, and on the openness and cooperation shown by the EIS team. We appreciate this opportunity to comment.

Sincerely,



Pauline D. Plaza
Regional Representative

PDP:glt

cc: Marc Bosch, President, Colorado Audubon Council
Kevin Markey, FOE
Anne Vickery, CMC
Hester McNulty, LWV

P.O. Box 1674
Grand Junction, CO 81502
August 26, 1982

Oil Shale Projects Team
BLM White River Resource Area
P.O. Box 928
Meeker, CO 81641

Ladies/Gentlemen:

As a newcomer to Northwest Colorado, but not a newcomer to Colorado, I initially hesitated to comment on anything as formidable as the Bureau of Land Management's Prototype Oil Shale Leasing Environmental Impact Statement. Just the name was overwhelming.

However, this is all the more reason that I, a low income, concerned Colorado taxpayer and resident ought to speak out tonight. The future of oil shale in the Piceance Basin of Colorado will, in fact, affect me. It already has and will continue to do so. However, I would like to see oil shale's impact on my life carefully controlled. I live in Colorado by choice (not accident): because of Colorado's wide open spaces, clean air and water, beautiful desert and mountain country, small towns, etc.

I have been in Colorado long enough to see ups and downs and changes in quality of life. In my opinion, at this time more oil shale leasing will not improve most of our lives. Quite the opposite. In my case, the areas I like for recreation stand to be eroded in size and quality; the wildlife I enjoy will be pressured; and the boom cycle will bring housing and food costs which I cannot afford.

More to the point, however, is the fact that current oil shale processes are intensely energy consumptive, resulting in a questionable gain of energy. Is it even possible that we take seriously such an industry in this day and age of energy awareness and conservation? This is not to mention the present economic infeasibility of oil shale, the problem of incomplete minerals recovery, and reclamation difficulties, etc.

Until better technology develops and economics become more favorable to the average person, I urge no further leasing of BLM lands for oil shale.

Thank you for this opportunity to comment.

Yours,

Jeanne T. Hemphill

Jeanne T. Hemphill

**MULTI
MINERAL
CORPORATION**

2996 TELLER COURT • GRAND JUNCTION, COLORADO 81501 • (303) 245-7428

August 31, 1982

Oil Shale Projects Team Leader
Bureau of Land Management
White River Resource Area
P. O. Box 928
Meeker, CO 81641

Re: Draft Supplemental EIS for the Prototype
Oil Shale Leasing Program

Dear Sir:

Multi Mineral Corporation has reviewed the above
referenced document and offers the following comments:

P. 9 - Summary 8th Full paragraph

The statement is made that the lower aquifer has a much higher salinity than the upper. Although this is true in some parts of the basin, in the area of the proposed leases there is actually not a great difference in salinity between the upper and lower aquifers. There are, however, significant quality differences between the aquifers, mainly in trace elements such as fluoride, arsenic, barium, boron, iron, lithium and strontium. USGS data taken from area wells TH75-6A and 6B in the upper aquifer and TH75-6B, -7B and -11B in the lower aquifer indicate that total dissolved solids (TDS) concentrations in the upper aquifer range from 612 to 1,020 mg/l and from 650 to 9,610 mg/l in the lower. Another well, Shell 23X-2, shows a range of 800-899 mg/l for the upper aquifer in the area.

The high salinity indicated by the sample which was 9,610 mg/l from the lower aquifer is a false reading resulting from dissolution of nahcolite at the top of the Saline zone. This statement is supported by the fact that the maximum TDS concentration for the lower aquifer during a 7-day pump test on the proposed C-18 tract was 1,040 mg/l.

These data were submitted by MMC in the Expression of Leasing Interest.

p. 27 - Chapter 2, Sodium

Since the preparation of this draft EIS MMC has assigned its interest in Sodium Lease C-0118326 to Wolf Ridge Corporation, a wholly owned subsidiary of Industrial Resources Inc. Several years of resource characterization coupled with experience gained through 2½ years of mining in the Saline zone at the Bureau of Mines Horse Draw facility have convinced MMC that a sodium-only development cannot be carried out economically when so much of the sodium resource is excluded from development by lease stipulations designed to protect the oil shale. We believe that production of sodium from the lease can be economical on its own but only if the entire resource is available. Even if sodium-only development could be initiated on the lease within the constraints of the stipulations, MMC believes that the sodium-only mine would not be able to compete with sodium products produced from a combined oil shale/sodium development. In light of these facts, obviously development of the sodium lease will not be initiated in 1982 as stated in this section.

(4)

P. 34 and 35 - Summary of Impacts, Geology

In the estimates of resource permanently lost as a result of development of C-11 under the three different types of technologies, both direct mining and mine assisted in situ are stated as definite losses by the use of "would." I believe "could" more properly states the degree of certainty on which this prediction is based. The statement on true in situ reflects the proper uncertainty by the use of "possible permanent loss." MMC believes that the resource not recovered by any of the three technologies could be recovered in the future either by an open pit or some other technology not yet developed.

(2)

P. 35 - Summary of Impacts, Soils

This section states that the impacts on soils from true in situ would be less than from both other development technologies. On page 37, Surface Reclamation, as well as other places, the statement is made that true in situ has the most surface disturbance and greatest potential for soil loss.

(11)

Also in this section the statement is made that leasing C-11 "would" be more damaging to the soil resource than leasing C-18. MMC believes again that the proper word is "could" since the impacts are totally dependent upon what is actually done on the lease, not on how many acres of a particular type of land exists.

(6)

p. 36 - Summary of Impacts, Wildlife

The statement is made that deer road-kills would be 15-86% greater for C-11 than C-18. Although it is true that C-11 contains major migration routes for mule deer any product movement from C-18 development will have to cross these same migration routes. It is hard to believe the kills could be 86% greater for C-11 when C-18 traffic will be using basically the same roads in the same area.

(12)

p. 38 - Summary of Impacts, Socioeconomics

The increased housing requirements in Meeker and Rifle for the C-11 alternative are based on a nahcolite mine being developed on the existing Sodium lease. Since MMC no longer has any association with the Sodium lease this potential development is doubtful. The current lessee has owned the lease since its issue in 1971 and very little activity occurred prior to MMC attempting to develop it. As stated earlier, MMC has severe doubts that a sodium-only mine can be developed under the existing constraints of the lease stipulations.

(4)

p. 38 - Summary of Impacts, Transportation

Again the doubtful nature of sodium development on the Sodium lease should be identified.

p. 39 - Combined Alternative, Geology

The estimate of permanent loss of resource resulting from direct mining is stated as being definite when again it should be "could" as it is in the estimates for mine assisted in situ and true in situ in this section.

(6)

p. 58 - Affected Environment, Climate

The sentence at the end of the first partial paragraph on this page is missing something.

p. 72 - Hydrology, Groundwater quantity

The next to the last paragraph in this section states that groundwater movement is upward from the lower aquifer through the Mahogany zone into the upper aquifer. As was shown by the data submitted in MMC's Expression of Leasing Interest, in the area of the proposed leases (specifically on C-18) the potentiometric surface for the upper aquifer is higher than the lower making it unlikely that groundwater could move upward against the gradient.

(13)

p. 102 - Spent Shale and Shale Processing Waste Disposal, Cementation of Spent Shale

The last paragraph of this section states that the sodium is removed prior to retorting. Sodium is also recovered following retorting from the Na value of the dawsonite as well as any sodium which was not recovered from the nahcolite prior to retorting.

(2)

p. 110 - Environmental Consequences, Air Quality

In the paragraph discussing the estimation of visibility impairment, the statement is made that mine assisted in situ (MAIS) at 50K and 100K BPD levels would cause impairment while the direct mining with surface retorting (DM/SR) would not. The reason for this is evident in reviewing the emission rates given on Table IV-1 which indicate MAIS has two times the emission rate for TSP, 3.7 times the rate for SO₂ and 3.4 times the rate for NO_x compared to direct mining with surface retorting. MMC believes there is too much disparity in these emission rates. The fact that TSP emissions for MAIS is more than twice that for DM/SR hardly seems reasonable when you consider the fact that a MAIS may only process 20-40% of the rock on the surface while to generate at the same level of production for DM/SR, 100% of the rock is taken to the surface for processing. Processing underground should minimize TSP emissions since the mine functions as an impinger removing particles as the ventilation air passes through the mine. The SO₂ emission rate 3.7 times higher for MAIS than for DM/SR also makes no sense. In fact the rate used for SO₂ emission exceeds state standards. The high emission rate for NO_x would appear to be due to higher temperature retorting, a condition that is not true for a hot gas to solids retorting in the absence of oxygen as proposed by MMC.

(14)

p. 123 - Development Alternatives, Extraction of Mineral in the Saline Zone

The compressive strength given for nahcolite (15,000 psi) is only true for the microcrystalline type of nahcolite which is found in a bed known as the Love bed as well as in lesser deposits in other parts of the Saline zone. Most of the nahcolite is of a coarser-crystal type and would have a much lower compressive strength than Love bed nahcolite.

p. 133 - Groundwater Quality, Aquifer Mixing Through Mine Development

The statement is made again that in the lease area, the lower aquifer has a much higher salinity level than the upper. This is not a true statement (refer to the first comment in this letter).

p. 186 - Adverse Environmental Effects Which Cannot Be Avoided, Geology

This section states that up to 75% of the mineral "would" be lost. As stated previously MMC believes "could" more correctly expresses the degree of uncertainty in the statement.

p. 187 - Short Term vs Long Term, Geology

Again this section uses "would" instead of "could."

p. 189 - Irreversible or Irretrievable Comittment of Resources, Geology

This section again states the loss of resource as definite by the use of "would." The first statement that the resources "would be left unrecovered" is true but MMC believes the use of "would result in even more resources being irretrievably lost" is more correct when stated as "could" since that fact depends on what occurs in the future, not on the fact that the entire resource is not recovered at this time.

p. 190 - Uncommitted Mitigation, Hydrology

It should be pointed out that the recommendation to operate retorts in excess of 800°C will preclude the recovery of aluminum from dawsonite. All available data indicates that dawsonite which has been subjected to high temperatures decomposes to a form of aluminum that is insoluble under all but the most severe conditions. MMC feels that recommendations such as this which involve processing conditions obviously need to consider more than just an attempt to minimize solubility in spent shale and would be more properly a part of DDP approval than this EIS.

(2)

(6)

(2)

Page 6

MMC would like to commend BLM for the excellent document which has been produced under the time and budgetary constraints which were part of the effort. Overall, MMC believes this Draft Supplemental EIS to be a concise and thorough evaluation of the potential impacts which might result from expanding the Prototype Oil Shale Leasing Program.

MMC appreciates the opportunity to make these comments and hopes they will be useful to BLM in preparation of the final EIS.

Sincerely,



Jim Meredith
Manager, Support Operations

JAM:ls

Sept. 1, 1982

Oil Shale Projects Team Leader

BLM

White River Resource Area

Box 928

Meeker, Colo 81641

Greetings;

I am writing this letter in regards to the proposed oil and gas basing of Tracts C11 and C18. I feel that these sites, located so closely to the existing C-a + C-b tracts poses several serious problems that need to be heard before permits are issued.

My overriding reaction is that there seems to be no purpose in leasing new tracts in the Resource Area since the two preceeding tracts have not met objectives. The burden then

posed by these two additional tracks would put undue strain on air quality, water drainage and wildlife habitats. (This EIS seems to be in conflict with the Department of Wildlife's ^{- Division -} goals to increase range). (15)

Certainly, at this stage of the economy there seems to be little use in gearing up the surrounding communities for definite socio-economic impacts (again!) when the track record for oil shale leasing is so poor.

The issues of traffic, noise, waste disposal have never been adequately examined other than mentioning them as potential areas of impact.

The economy also has not indicated oil shale as economically feasible. Even with multi-use permits the costs of mitigating impact could make this one of the

on again - off again that 16
is so devastating to local commun-
ities.

My own concerns revolve around drilling into the lower aquifers. I have never read any information on drilling operations that adequately deals with drilling safely near damage areas, protecting the aquifers or leaching harmful wastes into water supplies.

Many of these companies have decent records on reclamation however, the unanswered questions on waste disposal piles, soil erosion, and intentions on reclamation.

Oil shale technology is still very primitive. The inefficiency of the mining process seems like such a waste balanced against the detrimental effects. It is hard to believe that leasing

continues such a high $\frac{4}{16}$
percentage of shale is left unrecovered.
Certainly more valuable land
doesn't need to be turned over
to this type of experimentation
until the technologies have
improved to mitigate the technical
impacts and ^{increase} the efficiency of
shale recovery.

Now is NOT the time.

Sincerely,

Jimmy Aragon

Box 282

Glenwood Spgs CO

81602



The Colorado Mountain Club

GROUPS: ASPEN • BOULDER • DENVER • DENVER JUNIOR • DENVER WILDERNESS KIDS • EL PUEBLO
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2530 WEST ALAMEDA
DENVER, COLORADO 80219

OFFICE HOURS MONDAY THRU FRIDAY 9 A.M. to 2 P.M., AND MONDAY, TUESDAY AND THURSDAY EVENINGS 7 TO 9 P.M.

John Singlaub, Team Leader
Bureau of Land Management
White River Resource Area
PO Box 928
Meeker, CO 81641

September 2 1982

Dear Mr. Singlaub,

Following are comments from the Colorado Mountain Club on the Draft Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program. These comments supplement the comments presented at the BLM public hearing of August 24, 1982.

1) The CMC, in its February 11, 1982 scoping comments, asked that preference be given to potential lessees demonstrating zero emissions technology and less labor intensive technology. This request was not discussed in the Draft. With this request in mind, the Section in Chapter I, discussing the prototype program, should be expanded to include the following points:

a) The prototype leases and the existing private operations have been in various stages of development long enough to illuminate serious impacts. If the prototype program is to be expanded, technologies should be considered which deal more successfully with these impacts. The ones we are primarily concerned with are:

1) We have experienced diverse and unquantifiable socioeconomic impacts due to an influx of a huge work force. It is noteworthy that Colony, shortly before closing down, doubled the projected number of workers needed to complete construction. This indicates that even a sophisticated company such as Exxon does not have a good handle on manpower needs.

2) The "boom-bust" cycle seems inevitable, in spite of the good intentions of government and business. We are now aware of the ever widening repercussions this cycle has on local, state and national levels, on individuals, businesses and governments.

3) We are aware that air pollution from all sources associated with oil shale development will impact Wilderness Areas National Forests, local towns, river valleys and the Piceance Basin to a degree which violates several federal and state standards. This pollution is unacceptable to local people, to federal landmanagers and is contrary to the Wilderness concept.

b) Technology needs to be developed which is less manpower intensive thus cutting down on socioeconomic impacts and the impacts of the "boom - bust" cycle

c) Technology needs to be developed which eliminates or completely recycles emissions so that a zero emission state is achieved. A zero water discharge technology is presently employed by mining companies including two private oil shale operations. There is currently a call from politicians for recycling of hazardous wastes. It is high time that this concept was applied to air emissions which have a devastating effect on human health, crops, water and animal life.

Please discuss these concepts in the Final EIS

- 2) The Final EIS needs to clearly distinguish between a) baseline monitoring
b) monitoring during construction and operation and c) modeling.

a & b) Monitoring: The real question is: what the actual air quality will be over Class I Wilderness Areas, in the National Forests, in the Class II public lands, in the towns along the Colorado and White River Valleys and in the Piceance Basin; how will this air quality affect visibility, plant and animal life? The only way to effectively answer this question is to establish monitors in all the potentially affected areas: in the Class I areas, in the National Forests, up and down the river valleys and in the Piceance Basin. The Final EIS and the Stipulations should contain provisions requiring leasees to do complete monitoring, including inside the Class I areas, before construction and during construction and operations.

(20)

c) Modeling: The CMC requested in the scoping comments that emissions from all associated sources be modeled. The DEIS does not include this information, nor does the document explain that the projected levels of pollutants will inevitably be higher because associated sources will be adding emissions to the air.

1) The concept of the baseline in the DEIS is not clear. It is not clear that it is a modeled baseline. It is not clear that it does not include all the associated, secondary and tertiary sources whether they fall under PSD or not. It is not clear that it excludes some major point sources. It is not clear that the baseline is the same as the "no action" alternative. It is easy to confuse this baseline with the baseline monitoring which should be going on now. The modeled, "no action" alternative should include all existing, all permitted, all secondary and associated sources.

(21)

2) At worst the Final EIS should state that some secondary sources and primary sources have not been included, therefore the air quality impacts will be considerably greater than the level projected from the sources which are included in the modeling.

- 3) Impacts from oil shale development, including all associated sources, are projected to affect visibility and acid deposition in the Colorado Class I

(:

Wilderness Areas. With this in mind, the CMC requested in the scoping comments that an assessment of these impacts be made:

a) How will sulfates, nitrates, other fine particles and NO_x from all combined emissions contribute to visibility degradation in the Flattops Maroon Bells-Snowmass, Mt. Zirkel and Holy Cross Wilderness Areas and the mainstem valley of the Colorado River?

b) What will be the concentration of fine particles in the Flattops, Maroon Bells-Snowmass, Mt. Zirkel and Mt. of the Holy Cross Wilderness Areas and in the Class II areas in the White River and Routt National Forests?

c) In the Flattops Wilderness Area how will the cumulative emissions impact sensitive lichen species, brook trout, aspen and the Ph of Ned Wilson Lake, Surprise Lake and Parvine Lake?

d) In the Maroon Bells-Snowmass, Mt. Zirkel, Mt. of the Holy Cross Wilderness Areas how will the cumulative emissions impact sensitive lichen species, brook trout, aspen and the Ph of selected lakes?

It is important that a discussion on these specific issues be included in the Final EIS.

4) In the scoping comments the CMC asked that the EIS consider recreational impacts of increased populations from oil shale development; how that impact will be managed and mitigated; where the Forest Service will get the additional funds necessary for intensive management. Many people will take advantage of the recreational opportunities in the Wilderness Areas. We have learned from other Wilderness Areas that overuse and mismanaged use can create resource damage which may be irreversible. The Draft EIS limited the discussion of recreation mainly to hunting. We request that the Final EIS address the above concern.

5) Oil Shale Lease Environmental Stipulations:

a) Section 1(B) Changes in Conditions: The condition allowing changes in stipulations upon mutual consent only between the Mining Supervisor, the BLM District Manager and the Lessee is much too broad in scope. This condition must include provisions for public review of change in any stipulation that in any way affects public land, air water, wildlife and funds. The way the condition now reads would allow behind the scenes political pressure to be exerted on either government official. Where public resources and funds are involved, this situation must always be prevented.

b) Section 8(A) Air Quality: The CMC strongly objects to the provision that the lessees shall avoid or where avoidance is impracticable, minimize air pollution (underlining ours). Impracticable and minimize are very broad terms and give the lessee a way out in lieu of developing new and perhaps more expensive technologies to eliminate or recycle emissions. The possibility of serious, long-term and in some cases irreversible impacts from air pollution from oil shale development are so apparent that the choice must always be to eliminate emissions and other sources of air pollution. The lessees should be required to develop technology which avoids air pollution.

- 6) Included with this packet are the five slides shown at the public hearing:
- a) A view of one of the many lakes in the Flattops Wilderness, the second largest Wilderness area in Colorado, 235,000 acres, known for its fishing.
 - b) From Flattops looking north east to the Zirkel Wilderness eighty to ninety miles away.
 - c) Looking east from the same point as (b) to the Gore Range (Gore Eagle's Nest Wilderness) sixty to seventy miles away.
 - d) Looking south east from the same point as (b) to the Holy Cross Wilderness Area and the Maroon Bells-Snowmass Wilderness (center) seventy miles away.
 - e) A view of the Zirkel Wilderness, an area of 139,000 acres, known for its fishing.
 - f) A view from Davis Peak in the Zirkel Wilderness looking toward the Sawtooth Range.
 - g) One of the many lakes in the Zirkel Wilderness.

7) The State of Colorado has two National Monuments, Colorado National Monument and Dinosaur National Monument which could be affected by the leasing proposal. The Draft EIS does not discuss the air quality standards in effect for these areas, nor the impacts from development. These areas are unique to the state and are visited each year by many people from around the nation. The Final EIS should do a thorough analysis of air quality impacts from potential development on these areas.

(2)

Sincerely,

Anne Vickery
Anne Vickery
Conservation Director
Colorado Mountain Club



United States Department of the Interior

NATIONAL PARK SERVICE ROCKY MOUNTAIN REGIONAL OFFICE

655 Parfet Street

P.O. Box 25287

Denver, Colorado 80225

IN REPLY REFER TO:

N3615(492)

SEP 2 1982

Memorandum

To: Bureau of Land Management, White River Resource Area

From: Regional Director, Rocky Mountain Region

Subject: DEIS for the Prototype Oil Shale Leasing Program

The National Park Service has received and reviewed the Draft Supplemental Environmental Impact Statement (DEIS) for the Prototype Oil Shale Leasing Program. We are providing the following comments for your consideration in finalizing the document.

General

A fundamental concern that we have with this DEIS is that it presents potential impacts from additional prototype leasing relative to impacts from an artificially high baseline. This artificial baseline assumes production at a level which is unlikely to occur, and the impacts from the artificial baseline scenario are so immense that impacts from the proposed additional prototype leases appear insignificant in comparison. This is of particular concern because several of the sources identified in the baseline (i.e., the Colony and La Sal projects) may not even begin operation, let alone achieve the maximum production levels assumed herein, during the years analyzed for this DEIS.

(4)

Since the DEIS does not present combined impacts resulting from the baseline sources plus the proposed leases, the reader has no means of knowing the full magnitude of potential impacts.

(24)

Air Quality

In addition to problems with the baseline scenario, as stated above, an understanding of the air quality impacts from the proposed additional leasing is further complicated because not all of the sources which may reasonably contribute to this air basin are analyzed cumulatively. Specifically, the Uinta Basin Synfuels DEIS (BLM 1982) demonstrates that synthetic fuel sources in Utah will likely impact class I areas in Colorado. Yet these Utah sources are not considered in the prototype DEIS. The lack of a cumulative analysis, Utah plus Colorado sources, results in total impacts to air quality resources being seriously understated.

(14)

Year of
the
Visitor

The DEIS states that the National Ambient Air Quality Standards (NAAQS) for NO₂, SO₂ and TSP are violated under the baseline scenario, and that Prevention of Significant Deterioration (PSD) increments for SO₂ and TSP are exceeded under the baseline scenario. It is, therefore, difficult to understand how any additional leasing can be contemplated, since existing laws and regulations would not allow new sources to be developed in this air basin under these circumstances. The DEIS appears, by stating prototype leasing impacts in relative terms, to subscribe to the theory that if it's already dirty, why worry about making it dirtier.

(25)

While we believe, as the DEIS states, that it is possible that NAAQS are violated and PSD increments are exceeded under the baseline scenario, we note that these statements are contradictory to the conclusions of the Uinta Basin Synfuels EIS.

NPS Lands

The DEIS does not estimate or even mention the increased visitor use of NPS lands that is likely to accompany the projected population growth associated with issuing these leases. An analysis similar to that provided in the Uinta Basin Synfuels EIS (BLM 1982) would be useful for long-term NPS planning and management of park resources. We can provide visitor use statistics for NPS units, if that would be of assistance to you.

(21)

Mitigation Measures

The mitigation measures presented in the DEIS do not provide any indication of the technical, economic and/or political feasibility of their implementation, nor any quantification of mitigation measure effectiveness. The inclusion of mitigation measures such as those identified on page 9 (surface water supply), page 10 (transportation), and page 121 (air quality) are too general to be meaningful.

(26)

Conclusions

Based on the above, we do not believe that two of the goals of the 1973 Federal Prototype Oil Shale Leasing Program (which are reiterated in this DEIS) are well served by the leasing of additional prototype oil shale tracts at this time. These two goals are:

- to ensure the environmental integrity of the affected areas and at the same time develop a full range of environmental safeguards and restoration techniques that will be incorporated into the planning of a mature oil shale industry, should one develop; and
- to develop management expertise in the leasing and supervision of oil shale development in order to provide the basis for future administrative procedures.

(16)

The 1973 EIS recognized the environmental uncertainties inherent in oil shale development. The EIS stated that additional federal leasing should not be permitted until adequate environmental data are obtained from operating prototype leases which would allow more accurate predictions of environmental impacts for future oil shale project analyses. Inasmuch

as none of the existing prototype leases have yet reached full production levels, and thus neither the desired environmental impact data are available, nor management expertise acquired, it seems premature to proceed with additional prototype leases at this time.

Specific comments on the air quality technical report are enclosed. We appreciate the opportunity to comment on this DEIS. If you have any questions please contact me at FTS 234-2500, or have your staff contact Mary Ann Grasser at FTS 234-6419.

Lorraine Mintzmyer

L. Lorraine Mintzmyer

Enclosure

cc: Scott Archer, Colorado State BLM Office

19
pitkin county

506 east main street
aspen, colorado 81611

September 3, 1982

George Francis, State Director
Bureau of Land Management
Colorado State Office Building
1037 20th Street
Denver, Colorado 80202

Dear Sir:

This is in response to the Draft Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program which was recently released by your office. These comments should be considered as the official Pitkin County response to this EIS, and we appreciate your including them in the record.

We have the following general comments on the need for further leasing:

This EIS notes four objectives of prototype leasing that motivated the original 1973 program. We would like to review those objectives and present our analysis of the likelihood that further leasing will make progress in meeting them.

- 1) "To provide a new source of energy to the Nation by stimulating the development of commercial oil shale technology by private industry." Past experience, both with private and public land oil shale development indicates that resource availability is not a significant factor in limiting oil shale technology or production. In fact, the economics and politics of the oil industry have been decisive in dictating the boom-and-bust pattern of oil shale development. While prototype lease availability may alleviate some expense, the current status of operations on tracts C-a and C-b indicates that further leasing will not, in and of itself, provide a strong or guaranteed stimulus to further technological development. Furthermore, the technologies that the EIS identifies as being in need of further research (Multi-Mineral and True In-Situ development) are nowhere required of the lessee. If technological research is in fact a primary goal of the program it must be required in the body of the lease and not left to the discretion of the lessee.

- 2) "To ensure the environmental integrity of the affected areas and at the same time develop a full range of environmental safeguards and restoration techniques that will be incorporated into the planning of a mature oil shale industry, should one develop."

This has obviously not been accomplished through the initial round of prototype leasing, but it is difficult to imagine how further leasing would insure progress towards this goal over and above that that could be expected from existing private and federal developments. The environmental difficulties associated with oil shale development are so numerous and potentially so long-term, they should be the subject of specific research projects, rather than adjuncts to large-scale production developments and the social and economic impacts that accompany them. As noted under #1) above, if environmental impact-mitigation research is in fact an objective, requirements for such research must be incorporated into the body of the lease. Instead, many necessary mitigation measures, such as minimum topsoil depths on spent shale piles, and surface water quantity monitoring, are included under "uncommitted mitigation" that may or may not be eventually required of the lessee.

(28

- 3) "To permit an equitable return to all parties in the development of this public resource."

The weak expression of interest in further prototype leasing, the current depressed state of the oil shale industry and general economy, and the high costs of pursuing the preferred technologies (Multi-Mineral and True In-Situ), all suggest that even if prototype leases were offered, economic conditions would dictate against development at a scale that would meet the objectives of the program. This could, in turn, result in a lowering of environmental standards, a lowering of royalty rates, or an easing of other lease requirements and restrictions in order to further stimulate development. If objective #3 is to be met, it would seem to make much more sense to postpone further leasing indefinitely until economic conditions are such that timely development would be likely.

(16

- 4) "To develop management expertise in the leasing and supervision of oil shale development in order to provide the basis for further administrative procedures."

This goal could be reached through further leasing, but it is our judgment that the impacts which are identified as arising from further leasing are so great that this goal in itself cannot justify continuation of the leasing program.

Beyond these general and conceptual problems with expansion of the Prototype Leasing Program, we have several specific environmental concerns in response to the data presented in the EIS.

-Acquifer mixing - Chapter III, page 75 of the EIS notes the following: "The concentration of some trace elements within the lower aquifer are great enough to

be of environmental concern. Concentrations of barium, boron and lithium are consistently high in the northern part of the basin...Concentrations of barium exceed drinking water standards in 7 out of 11 wells sampled...The boron and lithium levels are high enough to be toxic to most plants." The threat to groundwater quality inherent in this statement is increased by the previous statements concerning the difficulty of avoiding or mitigating aquifer mixing and the relative lack of data on groundwater hydrology in the lease area. If the toxic elements of the lower aquifer were to degrade the relatively high-quality upper aquifer, a long-term, far-reaching environmental disaster could result, with effects far beyond the proposed development boundaries. (29)

- Wildlife - Several impacts from development of these leases will combine to severely impact wildlife, and particularly deer populations. Loss of critical winter range, disturbance of migratory corridors, increased hunting pressure, and increased potential for road kills and poaching will have a cumulative effect on deer populations. A weakness of the EIS's discussion of wildlife impacts is the absence of a table showing the total impact of these factors, plus several missing elements such as stress-caused losses, disturbance to fawning areas, and losses due to molybdenosis or unsuccessful revegetation. It appears that losses due to development of these sites could double losses resulting from all other currently permitted activities. Losses of this magnitude would be, in our view, unacceptable. Further, it must be emphasized that these are absolute losses and not merely displacement of population into other habitats. (30)

- Air Quality - We were struck by Figures IV 2 through IV 7. They seem to indicate that the majority of the private developments produce air quality impacts in the Roan Creek, Parachute Creek and Colorado River Valleys, while the Federal leases further north distribute their impacts further west to the Flat Tops Wilderness Area, contributing to the violation of Class I air standards in that area. This circumstance is inappropriate at best and contradictory at worst. (31)

- Vegetation - Optimistic estimates of total reclamation of disturbed sites and spent shale piles cannot be justified in light of the obstacles to successful revegetation which are noted in the EIS. These include:

1. Disposal or isolation of hazardous wastes
2. Achievement of spoils compaction sufficient to eliminate toxic leaching, erosion, salt loading, and slippage hazards.
3. Acquisition of sufficient topsoil to guarantee successful regrowth of native plants, including forage and shelter species.
4. Determination of responsibility for ongoing monitoring of revegetation success.
5. South-facing slopes, heat-absorbing materials, and other microclimate problems. (11)

These unresolved difficulties can only lead us to conclude that revegetation will continue to be inconsistent and problematic.

These are the most prominent, but by no means all of our concerns relative to these proposed leases. In general the overall social, economic, and environmental impacts which are identified cannot possibly be justified by the relatively small percentage of recoverable resource and the small overall contribution that would be made to our national energy needs. We urge the BLM to take no action on these leases at this time.

Yours truly,



Mark Fuller
Pitkin County Environmental Coordinator

MF:ph

Colorado-Ute Electric Association, Inc.

P. O. Box 1149

Montrose, Colorado 81402

Telephone (303) 249-4501

TWX 910-929-6924

September 3, 1982

Oil Shale Projects Team Leader
Bureau of Land Management
White River Resource Area
P. O. Box 928
Meeker, Colorado 81641

Dear Sir:

Draft Supplemental
Environmental Impact Statement

Colorado-Ute would like to thank the BLM for the opportunity to comment on it's Draft Supplemental Environmental Impact Statement (DEIS) for the Prototype Oil Shale Leasing Program. Although we will not be directly involved with the proposed leasing program, emissions from our planned and existing facilities are addressed in the DEIS.

The computer modeled air quality impacts section presented in Chapter IV, Environmental Consequences, is of concern to Colorado-Ute. All computer modeling techniques have inherent inaccuracies stemming from assumptions and simplifications of "real world" conditions. The general and estimated nature of modeled results should be clearly understood and stated in the DEIS, so as not to present an inaccurate picture to anyone reading this report. Colorado-Ute has done extensive modeling and monitoring of its facilities, particularly the Southwest Project, and our results differ greatly from that presented in the DEIS. As Martin Jablonski of our staff mentioned in a conversation with your Mr. Scott Archer, we are willing to share the results of our air modeling effort with you and your staff.

Another aspect of the air quality monitoring that presents a concern to Colorado-Ute is that your modeling, under the no action alternative (page 113), shows violations of the Class I increments in the Mt. Zirkel Wilderness Area, where presumably the source of the pollutants were from Colorado-Ute's Craig Station.

Oil Shale Project Team Leader

-2-

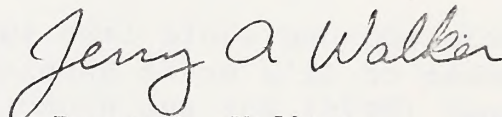
September 3, 1982

Although this is not explicitly stated, the modeled results on pages 117-119 show no interaction of the emission from the oil shale operations and Craig Station. If your modeling results were actually the case, Colorado-Ute would not have been issued permits by the State of Colorado and EPA to construct and operate Craig Station. In fact, the federal land manager that administers the Mt. Zirkel Wilderness Area concurred with EPA's analysis that no impacts would occur to that area prior to EPA issuing the Craig Station Unit's Prevention of Significant Permit.

(1)

We urge the BLM to carefully consider the limitation of the computer modeling used in the DEIS, and re-evaluate the scenarios based on that modeling. As stated earlier, if we can be of assistance, please do not hesitate to contact me at 249-4501.

Very truly yours,



Jerry A. Walker
Manager, Environmental Services

JAW/MGJ;jal



Chevron Shale Oil Company

Great West Plaza, Tower 2, 1625 Broadway, Suite 2150, Denver, CO 80202 • Phone (303) 623-8282

September 3, 1982

COMMENT ON THE DRAFT
SUPPLEMENTAL ENVIRONMENTAL
IMPACT STATEMENT (DSEIS)
FOR THE PROTOTYPE OIL SHALE
LEASING PROGRAM

3.18.2.4 BLM 1

John Singlaub, Team Leader
Bureau of Land Management
White River Resource Area
P. O. Box 928
Meeker, CO 81641

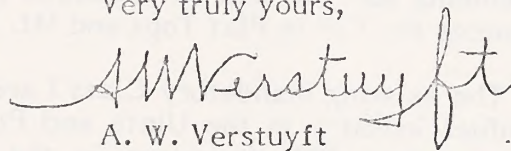
Dear Mr. Singlaub:

Chevron Shale Oil Company (CSOC) appreciates the opportunity to comment on the subject DSEIS. As a natural resources company, we are interested in orderly development of both public and private land while ensuring a sound environment for future generations.

We have reviewed the DSEIS and attended public meetings on the document. The Affected Environment (Chapter III) and Environmental Consequences (Chapter IV) sections on air quality, underground shale disposal and socioeconomics need up-date or revision. In synthesizing the input reports, important caveats have been omitted from text of the environmental consequences. The preliminary nature of the development cases without specific detail lead to conservatively overemphasized impacts.

If you have any questions on our comments in Attachments I - III, please contact me.

Very truly yours,


A. W. Verstuyft

AWV:gp

Attachments

cc: D. E. Hurst
G. K. Fisher
M. J. Rock

A-25

ATTACHMENT I

Air Quality

The DSEIS is based on the work of D. L. Dietrich, D. G. Fox, M. C. Wood and W. E. Mariatt "Air Quality Impact Assessment for the ESEIS for the Prototype Oil Shale Leasing Program." Concurrent with their analysis, D. A. Latimer, W. R. Oliver and M. A. Yocke "Air Quality Impact Analysis of Synthetic Fuel Development in the Uinta Basin" analyzed similar data for the Uinta Basin Synfuels Development (Utah BLM). The TAPAS modeling used in the DSEIS is not validated as is RTM (see ES&T 16 #7, 386A (1982)). While the general modeling approach (Dietrich et.al. Section 2) is sound, the results shown in Table IV-2 (p. 113) are grossly overpredictive. The predicted NO_x impacts on Rifle, Colorado for the 2003 high level (p. 121) exceed by fivefold the worst value ever recorded in the South Coast Air Quality Management District (U.A. Basin). SO₂ and TSP values are grossly overestimated.

(33)

(34)

Please refer to the Latimer report as referenced in the DSEIS that shows all of the proposed Piceance Basin Oil Shale Facilities in Colorado can be sited without exceedance of applicable air quality standards and PSD increments, except the Cathedral Bluffs facility which could violate the 24-hour average SO₂ PSD Class II increment and possibly the Class I increment in the Flat Tops Wilderness Area (see additional discussion of Flat Tops impacts below). These violations could be avoided if, as recently announced, the one high emission facility is not built or if better emission control technology than that assumed in this analysis can be employed. Maximum 24-hour average TSP concentrations at the site boundaries of a number of these Piceance Basin oil shale facilities may approach the Class II increment.

Secondary Emissions. The impacts of associated regional population growth and residential and commercial development (so-called secondary impacts) will be within all applicable standards, except that total suspended particulate (TSP) concentrations, which are currently in excess of standards throughout much of the region, will be exacerbated. Most of this impact is due to windblown dust and dust raised from unpaved and gravel roads. These large particles are not respirable and do not affect regional visibility. In addition, if this fugitive dust from secondary sources is included in the consumption of the PSD increments for TSP, and mitigation measures, such as paving roadways, are not employed, it is quite likely that PSD Class II increments for TSP will be exceeded in much of the region and that PSD Class I increments for TSP in Flat Tops and Mt. Zirkel may be exceeded.

Flat Tops Wilderness. The existing mandatory Class I area with maximum impacts from the proposed synfuel industry in the Uinta and Piceance basins is the Flat Tops Wilderness. If secondary TSP emissions in the Piceance Basin are not mitigated and are counted in the Class I increment consumption, without question there will be a violation of the Class I TSP increment. If not, then the Class I SO₂ increment could be constraining if all the Uinta and Piceance sources are considered and upper-bound estimates of maximum 3- and 24-hour average SO₂ concentrations in Flat Tops are utilized. Indeed, the substantial emissions from the proposed one facility dominate impacts in Flat Tops. If this project is shelved indefinitely, as recently announced, the Class I increment is not likely to be consumed in Flat Tops.

Attachment I
Page 2

Visibility Impairment. Even for the maximum synthetic fuel development scenario studied, regional visual range (visibility) will largely be unaffected by the industrial, commercial, and residential developments. Significant, local reductions in visual range could be observed in stagnant haze layers principally in the winter. These hazes would be caused by TSP emissions from industrial facilities, windblown dust, dust from roadways, and smoke from residential wood stoves and fireplaces. These hazes would be infrequent and localized and would not affect regional visibility and views in wilderness areas. Worst-case reductions in regional visual range are anticipated to occur in the summer when sulfate formation rates are highest. Worst visual range reduction is projected to be less than 10 percent and would be principally due to sulfate aerosol formed in the atmosphere from regional SO₂ emissions from synthetic fuel facilities and power plants. The predicted high TSP concentrations from secondary emissions are not expected to greatly reduce regional visibility. They would only cause local dust clouds.

Acid Deposition. Wet and dry deposition in the middle of the developed areas in the Uinta and Piceance basins may be at rates as great as those experienced currently in large areas of the eastern United States and in Europe. However, at distances beyond about 50 km from development areas, in wilderness areas, and throughout most of the region, deposition rates are expected to be typical of worldwide background conditions.

ATTACHMENT II

Underground Shale Disposal

P. 103, Column 2, last paragraph to p. 104, Column 1, paragraph 1-2. Our engineering judgment indicates less than 16-30%, depending on swell and compaction, of the spent shale could be backfilled in the mine.

} (29)

ATTACHMENT III

Social and Economic Effects

The draft EIS discusses the potential social and economic affects of the prototype leasing program. In some instances, negative statements are made without any supporting evidence. The draft fails to consider the planning for growth and the infrastructure expansion that has already occurred. It does not address the potential cooperation between the shale industry, the private sector, and various levels of government to manage growth. The draft seems to assume a worst case, "Rock Springs" analysis, ignoring both the planning for growth, and in some cases, the implementation of those plans that have already occurred. Specific comments, by page, are offered below:

} (35)

1. Figures S-1, S-2, S-3, pages 5, 6 and 7:

How were the population projections developed? What assumptions were used for employment and secondary population? The "no action" projections for Rifle appear high.

} (36)

2. Page 10.

On what basis was the conclusion reached that "severe social structural breakdowns"... will occur? Is this with or without mitigation by oil shale developers? Is it with or without planning and growth management by local, state and federal agencies? Does it assume that all employees and induced population will live in existing communities, or were new towns and construction worker housing facilities considered?

} (37)

3. Page 27.

Are the estimates of where employees will live supported by any monitoring data? For example, the Council of Governments estimates that 30% of employees will live in DeBeque, 14% in Rifle, and 16% in Parachute. This does not seem to track the actual growth in these communities.

} (38)

4. Pages 33-34.

An influx of construction workers...creates...an alienation with existing townspeople. This is an all-encompassing statement without regard to housing and recreation programs for construction workers, or the existing composition of the communities. Are people in Rifle really alienated from construction workers? What about existing residents who are construction workers? Does the alienation extend to all construction workers, such as home builders, or just to shale oil workers?

} (40)

5. Page 34.

The adverse impacts listed assume no mitigation by companies, no preplanning by government, and no financial assistance programs.

} (39)

6. Page 33.

On what basis are the tax projections made? Does this include only property tax, or all tax revenues? Does it cover only direct taxes, or taxes derived from induced development also?

} (41)

7. Page 39.

On what basis is the assessment of "severe" and "very severe" social impacts made? What is the distinction between the two?

(37)

8. Page 40.

What is the distinction between property taxes and revenues? Property taxes are revenues. Is this paragraph defining a budget deficit? If so, the assumptions concerning tax levies and assessed valuations should be clarified

(42)

9. Page 86.

"A rise in crime seems to be general." Is this "rise" arithmetic or geometric? Is it related to newcomers or oldtimers? Has there been a change in law enforcement personnel or reporting procedures? The cause and affect relationship is unclear here.

(43)

10. Page 86-87.

"....a rise in marital counseling..." Again, the cause and affect relationship seems unclear as does the validity of this "statistic."

(44)

11. Page 87.

"...hiring professional planners is strong evidence that local government planning processes are becoming more formal. Throughout the United States most communities are hiring professional staff. It is unlikely that any community in Colorado as large as Glenwood Springs does not have a professional planner and a professional city manager. The cause and affect relationship with oil shale development is not supportable.

(45)

12. Page 88.

Meeker hired a professional City Manager in 1978.

(2)

13. Page 88.

"....boom conditions which bring about social changes with their individual social psychological stresses...." What is the basis for this statement?

(46)

14. Page 89.

What is the basis for the conclusion about Rangely's "concerns about rapid growth"?

(47)

15. Page 95.

New construction is not covered under the 7% property tax limitation.

(48)

16. Page 158.

In many cases, operations workers build up gradually during the construction phase of the project. Also, many construction workers have long term jobs lasting a number of years on one project.

} (49)

17. Page 159.

"....accompanying social disruption in the community..." This apparently assumes no mitigation, no construction worker housing facilities, no construction worker recreation programs, no pre-planning by the Community, and no cooperation between government and industry.

} (35)

18. Page 159.

Many construction workers are married, and commute home on weekends. During the week they have "single status" in construction worker housing facilities. One key to managing the impacts during the construction phase is pre-planning, and good cooperation between the company and the community.

} (2)

19. Page 166.

"....severe quality of life deterioration..." How was this conclusion reached? What defines "quality of life"? For some people it might be a steady job, for others might be increased shopping opportunities, and for others it might be maintenance of the status quo.

} (50)

20. Page 166.

"....The small town atmosphere and ethos with their associated psychological comforts for oldtimer citizens would be lost permanently..." What is the basis for this statement, particularly the conclusion it reaches? Some oldtimers are the strongest proponents of development.

} (51)

21. Page 166.

Marital disturbance, divorces, alcoholism, etc. exist in most communities, including those undergoing no growth at all. As a community grows more support systems may exist to deal with these problems, and reporting of such problems may become more formalized.

} (53)

22. Page 167.

".... continued or worsened local inflation in housing costs..." In fact, increased local building activity, more money in local banks, and subdivisions that meet FHA or VA standards may increase the choices and reduce the costs of housing.

} (54)

23. Page 187.

"....lost would be the lifestyles and values associated with the small ranching towns..." What is the basis for this statement? What are the specific

} (2)

lifestyles and values, and how are they different in a community of 500, 1000, 2000, 3000, etc.?

24. Page 188.

Are there no short term positive benefits, such as increased planning capacity, increased local spending, a new labor and volunteer pool, etc?

(55)

25. Page 189.

What is the basis for the conclusion on changing lifestyles and values?

(56)

26. Page 191.

Mechanisms already exist for prepayment of property taxes and for severance tax credits. There is no evidence to conclusively support the need for increased severance taxes. From 1977 through 1981, 370 grants totalling \$32,100,982 were made to local government from the severance tax fund. This is in addition to severance tax funds that go to the state school fund and the state general fund. A recent petition drive to increase severance taxes has failed and was, in fact, opposed by many local leaders in northwest Colorado.

(57)

27. Page 191.

Construction worker housing facilities are not just trailer parks. They may include motel type accommodations, RV parks, recreation, laundry, and eating facilities.

(58)

Terry H. Allen
VICE PRESIDENT
ALTERNATE FUELS

CITIES SERVICE COMPANY
Chemicals & Minerals Group
Box 300, Tulsa, Oklahoma 74102

September 3, 1982

Oil Shale Projects Team Leaders
BLM, White River Resource Area
Box 928
Meeker, CO 81641

Gentlemen:

Cities Service Company wishes to offer comments on the draft Supplemental Environmental Impact Statement (SEIS) for the prototype oil shale leasing program. Cities is the owner of approximately 10,000 acres of land in southern Garfield County, a portion of which is underlain by oil shale of potentially commercial value.

Many of the conclusions offered in this supplemental EIS could adversely affect the future development of private oil shale lands, such as Cities' in Garfield County. Because of these possible impacts on Cities' property, the following comments are offered.

The whole subject of air quality as discussed in this EIS is a very sensitive one. Unfortunately, for some reason that is not clear, and in fact is not even eluded to, in the EIS, BLM chose to use non-standard, unverified, extremely over conservative, and by Cities Services' outside expert's opinion possibly technically flawed model in the EIS.

The use of this overly conservative model could presumptively lead to a decision against additional leasing. It also suggests that construction of a sizable percentage of the private development anticipated in the region might not be feasible.

Cities Service suggests that the BLM rethink and, in fact, redo this analysis using an EPA standard model. BLM should also caveat this model and any other one that it uses in the "Summary" portion of the SEIS since it is the main portion of the EIS that decision makers will use.

Cities finds evidence in the SEIS itself, that the BLM understands some of these problems. For instance, on page

(32)
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(24)

109 it states in part "therefore the worst case assumptions in computer results expressed in this Environmental Statement, should not necessarily be construed as a basis for deciding not to lease". This, seems to imply that BLM has second thoughts about the use of the modeling techniques used. More fundamentally, Cities problems with the modeling techniques used can be summarized under three main headings:

First of all, the model technique used is a non-standard technique which has no interagency recognition. Hence, since the primary agency concerned with air quality modeling is the EPA, this TAPAS model has no formal standing at all with EPA.

Furthermore by federal law and by EPA regulations, there are only certain models approved by EPA for regulatory purposes. Hence, the TAPAS model has no regulatory authority at all and there should be no discussion at all in this EIS about compliance or non-compliance with PSD regulations.

Cities recommends that all reference to PSD compliance or non-compliance be removed from the SEIS if BLM persists in using this TAPAS model.

Cities second main point is that the TAPAS model makes use of a technique which has not been verified for the pertinent situation. The only verification of this model has apparently been undertaken in flat terrain in North Dakota. Such terrain is not a suitable location for verifying a model used in the rough terrain situation of western Colorado.

Finally and perhaps most fundamentally, the model results are questionable because they attempt to analyze the situation outside the realm of modeling practice, that is, a near zero wind speed. A careful analysis of the SEIS and the its backup document indicates that most of the extremely high 24-hour SO₂ standards violations, to use an example, are the result of the use of such unrealistic near zero wind speeds.

In the case of the worst supposed standards violation, there was also the compounding factor of use of the model for closein receptors. The type of model is not suitable for closein receptors. The use of near zero wind speeds is enough of a problem in modeling practice as it is.

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(33)

(34)

Page 3

Unfortunately, in the case of 24-hour impacts, the model itself apparently has another major problem, in fact, what can only be described as a possible fatal flaw.

The model appears to violate one of the most basic principles of physics, that is the first law of thermodynamics that says, all matter and energy is conserved. To put it another way, the model appears to operate in such a way that the emitted pollutants are brought to a point in space and left suspended but the air which carries them either moves on or disappears.

(6)

Such simply does not occur in nature. And hence, the model numbers appear overly conservative. Until such time as such inconsistencies can be removed from this model, it should not be used either in a regulatory fashion or even for descriptive purposes since there appears to be basic problems with its use. Consequently, the air quality impacts listed in the EIS in Chapter 4 and in the summary appear incorrect. Any statements about the so-called no-leasing case as having detrimentally high air quality impacts, especially in the Rifle area, are simply not operative.

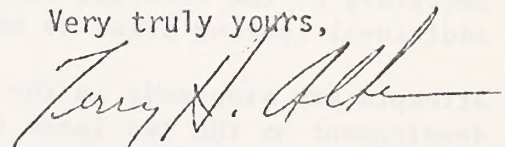
(34)
(248)

Cities Service strongly urges that all such statements be removed from the EIS and that the conclusions of the EIS with regard to such air quality violations be drastically changed to conform to more conventional modeling practice.

Whether it is possible to make such changes and issue the EIS as a final EIS under the proposed time schedule or not, is unknown at this time. However, if it is not possible to make these reevaluations, Cities would suggest that BLM suspend this process until such time as a proper modeling exercise has been undertaken and another draft EIS issued.

Thank you very much for the opportunity to comment on this EIS.

Very truly yours,



THA/RJC-M/134d
cc: Mr. George C. Francis
State Director, BLM
1037 20th Street
Denver, CO 80202

Shell Oil Company



Woodcreek
P. O. Box 2906
Houston, Texas 77001

Jack L. Mahaffey
Vice President Mining

September 3, 1982

Oil Shale Projects Team Leader
White River Resource Area
Bureau of Land Management
Department of the Interior
P. O. Box 928
Meeker, CO 81641

Dear Sirs:

RE: DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM

This letter, with attachment, constitutes Shell Oil Company's comments on the Draft Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program (DEIS). Comments of a general nature are presented within the body of this letter while specific comments referenced to appropriate page numbers in the DEIS are presented in the attachment.

The Bureau of Land Management is to be commended for its diligent efforts in preparing the Supplemental EIS. Generally, the DEIS indicates a strong attempt to sensibly analyze the potential impacts of future prototype leasing. Several areas of concern have been identified by Shell which are addressed below.

The Supplemental EIS (Draft and Final) is being prepared as part of the decision making process to lease additional Federal lands for oil shale development and not in conjunction with the review of specific lease development plans. Consequently, detailed impact analyses based on specific development proposals have not been possible and in some instances (i.e. air quality, water quality and quantity) worst case impacts have been presented in the DEIS. The final EIS should clearly indicate that actual impacts may be less severe so that the Secretary of the Interior is accurately informed of the potential impacts of additional leasing prior to making final a leasing decision.

(4)

Attempts are also made in the DEIS to compare the potential impacts of development on the two lease tracts without the benefit of any detailed development plans. As a result, the two tracts have been "ranked" with regard to the severity of potential impacts. This ranking is inappropriate unless the comparisons are made for specific development scenarios applied equally to both lease tracts.

(62)

The cumulative impact analyses presented in the DEIS appear to be based on the assumption that all of the announced oil shale projects, on both public and private lands, in the Piceance Basin will be in production at the time a new prototype lease is brought into production. However, recent actions by oil shale developers appear to indicate a reluctance to proceed with commercial scale development on many of these properties. The Final EIS should reflect the fact that due to the strict diligent development provisions found in a prototype oil shale lease and the current delays in other projects, development of newly leased Federal oil shale may, in fact, precede a significant portion of the other development in the basin.

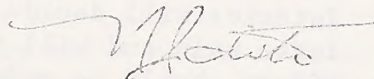
(4)

A final point which needs to be emphasized is the impact which would occur should the decision be made not to lease additional lands under the prototype program. The vast majority of land in the basin depocenter is held by the Federal government and as such has been unavailable for the development of new technologies applicable to the unique deposits located there. This situation exists in spite of the fact that one of the primary goals of the prototype leasing program, as established in 1973, is "to stimulate the development of commercial oil shale technology by private industry". The Final EIS should clearly reflect that failure to lease Federal lands in the depocenter of the basin would effectively block the development of technology applicable to this part of the basin.

(63)

We hope our comments will be of assistance in preparing the Final EIS and proceeding with additional prototype oil shale leasing.

Sincerely,



For: Jack L. Mahaffey

SDP:CC

Attachment

SHELL OIL COMPANY
COMMENTS ON DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT
FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM

1. Page 1 - It is our understanding that discrepancies exist in the total estimated in-place reserve figures for the two tracts. These discrepancies should be corrected in the final EIS. (64)
2. Page 9 - Statements are made regarding groundwater quality problems including (1) the contamination from leaching of flooded retorts, (2) aquifer mixing due to extraction of the mahogany zone and (3) surface water impacts including reduced flows to Piceance and Yellow Creeks resulting from mine dewatering.

It should be noted that retorts within the unleached zone would occur where no mobile formation water exists and retorts within the Mahogany zone, through proper design, could be separated from the aquifers by impermeable layers of unretorted oil shale. Also, mining of the mahogany zone may not involve the complete removal of the impermeable stratum separating the two aquifers and mitigation of reduced streamflows could include surface disposal of treated produced water from the mining operation. (2)
3. Page 15 - After release of the final EIS, the Secretary of the Interior will decide whether to proceed with the proposed lease sale and will issue a "Decision Document". Every effort should be made to issue the decision document as soon as possible so that industry can proceed with preparations for participation in the lease sale.
4. Page 16 - Minimum royalty payments based on the estimated recoverable oil shale reserves are required beginning in the sixth lease year. Will the order of magnitude of these payments be similar to the previous prototype leases? When will the actual tonnage figures on which minimum royalties are based be determined and made available? (65)
5. Page 17 - Problems exist regarding the leasing of oil shale on the existing sodium leases currently held by Industrial Resources, Inc. Resolution of these problems and consummation of an agreement between the sodium lessee and the Department of the Interior regarding joint development of the resources should be accomplished prior to the Secretary's decision to proceed with the lease sale. The lease sale should not be delayed by inability to reach an agreement regarding the development of the sodium minerals on Tract C-18.

6. Page 18 - The development of new technologies is one of the primary objectives of the prototype leasing program. Since leasing of C-11 and/or C-18 would be the first opportunity for development of a Federal oil shale lease in the depocenter of the basin, maximum flexibility in the choice of technologies must be maintained. Specification of the type of development, order of development, or relative amounts of mineral products would be inappropriate. (19)
7. Page 19, 78-81 - Specific "committed" mitigation measures in addition to the lease environmental stipulations are listed. It should be noted that the restriction of human activities for a period of four months within critical deer winter range would effectively limit surface activities on tract C-11 to eight months out of every year. The potential impacts of such a restriction on meeting the diligent development requirements of the lease should be fully analyzed. In no event should operations be completed restricted for a four month period out of every year. In addition, clarification is required as to what requirements will control in situations where specific lease provisions conflict with other non-lease committed mitigation measures. (66)
8. Page 23 - Shell's expression of interest stated that Shell would propose to evaluate the development of the unleached zone by in-situ mining and in addition, would evaluate other technologies applicable to other potentially mineable zones. No commitment to a specific technology has been made and Shell would expect to maintain maximum flexibility as to choice of technology and type of development should Shell be successful in acquiring a lease tract. (19)
9. Pages 27-34 - Several references are made to the potential development of a sodium mine by Multi-Mineral Corporation which would impact portions of Tract C-18. The final EIS should be updated to reflect the recent announcement of Multi-Mineral's withdrawal from participating in this development. In addition, the status of the mine plan submitted for development of the sodium leases currently held by Industrial Resources, Inc. and the relationship of this mine plan to development of C-18 should be fully discussed. (4)
10. Page 28 - Tract C-11 contains the U.S. Bureau of Mines Horse Draw experimental mine. Any and all liabilities incurred by the oil shale lessee with regard to this facility should be addressed in the FEIS. If substantial liabilities are involved, the tract boundary shall be redefined to exclude the Horse Draw mine from the lease tract. (2)

11. Pages 33
100, 122,
186
- Conflicting statements are made regarding existing oil and gas leases and operations on the proposed oil shale lease tracts and their relationship to development of the oil shale resource. In certain instances, statements are made that "oil and gas exploration and production could continue unimpeded and temporarily prevent extraction of 72 percent of the in-place oil shale per acre" and that pillars would have to be left around each well to protect its integrity. However, other statements indicate that current oil and gas lease stipulations require that drilling not interfere with mining and recovery of the oil shale.
- (67)
- The specific stipulations found in existing oil and gas leases regarding development of oil and gas and the impacts on oil shale recovery should be fully stated in the final EIS. In addition, a full discussion of the potential constraints on oil shale recovery due to conflicting oil and gas operations is warranted. The current lessees and the duration of the existing oil and gas leases on tracts C-11 and C-18 should also be identified.
- (68)
12. Pages 34-35
- We do not agree with the conclusion that large percentages of the resource will be rendered unrecoverable due to development by the various recovery methods. The losses are speculative in nature with no basis stated as to how the unrecoverability figures were calculated.
- (69)
13. Page 35
- We assume that the statement: "Recovery utilizing true in-situ dissolution mining is presently unknown" refers to the actual production of minerals and not to the existence of an in-situ dissolution recovery method. As stated in our expression of interest, Shell has a patented process which features dissolution and recrystallization of the inorganic minerals and thermal decomposition of the kerogen into shale oil. In addition there is no technical basis for the statement that "recovery should probably be highest by direct mining" with respect to the saline zone, since no recovery method, direct, mine assisted in-situ or true in-situ, has been demonstrated to be applicable to the saline zone on a commercial scale.
- (70)
14. Page 35
- With regard to soils, it should be noted that the amount of damage is directly related to the technology employed and the tract involved. It is misleading to compare the impacts from leasing C-11 or C-18 when such impacts will depend on the specific technology involved. Conceivably, development of tract C-11 by a true in-situ method would result in less soil damage than direct mining of tract C-18.
- (62)

15. Pages 35, 68 - With regard to the alluvial valley floors which have been identified in Ryan Gulch and Horse Draw, it should be stated whether formal determinations of their existence and extent have been made and by which government agencies. Further, if it is intended in anyway to limit or disallow development in these areas, the tract should be redefined to include alternative developable acreage. (71)
16. Page 37 - The net energy analysis states that the true in-situ method would be the least energy efficient method of shale oil production. While this may be accurate with respect to in-situ development of the leached zone, heat losses may not be as significant in the unleached zone, where mobile formation water does not occur. (2)
17. Pages 40, 42 - The assumption is made that tract development will begin with development of the saline zone followed by recovery from the upper zones of shale. It is equally possible that development could begin with the mahogany zone followed by recovery from the leached and/or unleached zones. Another possibility would include the utilization of two operations at different levels so that production of shale oil would not be restricted by the market limitations for nahcolite. (Note: Comment number 6 also relates to development restrictions.) (19)
18. Page 40 - The statement is made that direct mining of the saline zone must include backfilling of mined out areas in order to maximize overall recovery and allow recovery of the upper shale zones. It should be noted that recovery from the upper zones first may obviate the need for such support.
19. Pages 41-42 - It should be emphasized that virtually all the surface impacts from a "true in-situ" operation are temporary in nature and that restoration of the surface can proceed contemporaneously with new development. (11)
20. Page 43 - Oil shale leases are currently limited to 5,120 acres by provisions of the Mineral Leasing Act of 1920. However, since a combined alternative of leasing two tracts totaling 10,240 acres has been analyzed, leasing one tract larger than 5,120 acres would be possible should the Act be amended prior to issuance of the lease sale notice.
21. Page 45 - We know of no convincing reasons for delaying or phasing the lease sale beyond the proposed March 1983 date. The development of technologies applicable to the saline zone would only be further delayed should the proposed sale be postponed.

22. Page 64 - Oil shale room and pillar mine plans have been developed based on conditions found in the southern portion of the Piceance Basin. Little information and no experience is available concerning direct mining of the mahogany zone or other potentially minable intervals in the center of the basin. Therefore, possible recovery rates are unknown at this time and must await detailed evaluation including extensive rock mechanics analyses. (72)
23. Page 75 - With regard to hydrologic information for the Piceance Basin, it should be noted that Shell Oil Company holds some water rights on the White River, and is actively involved in the White River Study group concerned with future developmental impacts on the White River drainage.
24. Pages 109 - - With regard to the predicted impacts on air quality from
122 new sources in the Piceance Basin, several discrepancies were brought to the attention of the Bureau of Land Management at the public hearing held in Denver on August 24, 1982. In particular, it was noted that the proposed Superior project was located in error and that the inclusion of impacts from new programmatic Federal leases was inappropriate. Corrections should be made in the final EIS. (14)
25. Page 123 - We fully agree that combinations of various technologies may be possible and that such combinations could result in overall higher resource recoveries. Precise development scenarios are impossible to predict at this time and must be based on complete evaluations of the leased tract(s).
26. Page 124 - We agree that postponing the proposed lease sale in hopes of a technological breakthrough is unwarranted. Indeed, delay of the sale may virtually eliminate the chance to develop technologies applicable to the shale zones only present in the basin depocenter.
27. Page 133 - With regard to the potential for aquifer mixing as a result of mine development, it should be noted that direct mining of the mahogany zone may not result in complete removal of the impermeable stratum separating the two aquifers. The mahogany zone in the depocenter of the basin is substantially thicker than that found in the demonstration mines in the southern portion of the basin. (2)
28. Page 137 - It should be stated that the projected impacts on the White River resulting from lease development represent a worst case due to the assumptions that four barrels of water would be consumed per barrel of shale oil produced and that all of the water would be removed directly from the river.

29. Page 186 - It is stated that the assignment of the existing sodium lease would be announced in the lease sale notice at least 30 days prior to the lease sale should tract C-18 be offered for sale. While such a notice is appropriate, it is imperative that the government obtain an agreement to assign from the sodium lessee as soon as possible and announce in detail the agreement in a public notice.
30. Page 211 - Section 12(d) of the Oil Shale Lease states that all water rights developed through operation on the leased lands immediately become the property of the lessor. It should be clarified that this clause is only applicable to water rights developed on the leased lands and not those developed off-tract in conjunction with lease operations. (2)
31. Page 211 - Section 13 of the Oil Shale Lease states that in-situ development should not cause induced fracturing to extend to within 100 feet of the lease boundary. Induced fracturing should be defined to exclude microfractures inherent in the oil shale which may be utilized during in-situ development but would pose no threat to the off-tract resources. (73)
32. Page 212 - Section 18 of the Oil Shale Lease restricts the work day for underground workers to eight hours. As this is a statutory requirement (Mineral Leasing Act of 1920), there is no need for it to be included as a lease term and the lease should be modified to remove it. (74)
33. Page 212 - Section 19 of the Oil Shale Lease requires the lessee to permit access to books, records and accounts to the Secretary of the Interior and the Secretary of Labor to ascertain compliance with Labor Department rules, regulations and orders. We question the need for such access by the Secretary of the Interior for these purposes since only Labor Department rules, regulations and orders are involved. (75)
34. Page 231 - Section 9(E) of the Oil Shale Lease Environmental Stipulations requires the lessee to maintain 200-foot buffer strips on each side of a stream in a natural undisturbed state. It should be clarified that this requirement only applies to perennial streams and not to the many ephemeral drainages which are found on the lease tracts. (2)
35. Page 236 - Section 14(E) of the Environmental Stipulations refers to slurry waste disposal. It should be noted that a nahcolite slurry which might be utilized in in-situ development (e.g., Shell's expression of interest) should not be considered within the definition of waste slurry. (76)

36. Page 247 - The definition of "baghouse" found in the glossary should be clarified to indicate that such pollution control equipment is normally "designed" to filter particulates at over 99% efficiency.
37. Page 248 - The definition of "hydrocarbon" found in the glossary, while chemically correct, includes only pure compounds while in reality the term is utilized to include many compounds which also include other elements, such as nitrogen, sulfur and arsenic.

EDITORIAL COMMENTS (Corrections and/or comments shown in parentheses)

- Page 3 - The No Action Alternative examines the impacts of development that may occur without this (this) leasing.
- Page 16 - The royalty rate for shale oil under this prototype program would be 12 cents for each ton of oil shale mined for processing that contains 30 gallons for (of) shale oil per ton of material.
- Page 58 - Severe weather conditions such as tornadoes, floods, damaging hail and winds (this is an incomplete sentence).
- Page 75 - In general, water in the upper aquifer is of better quality than the lower aquifers (aquifer).
- Page 101 - Reclamation would closely follow disturbance which involves on several types of soil and vegetation. (needs to be restated)
- Page 123 - The leached zone would generally not be ameanable (amenable) to direct mining...

(6)

SDP:CC
9/3/83

Oil Shale Projects Team
BLM White River Resource Area
P.O. Box 928
Meeke r, Colorado 81641

This is in response to the BLM's Prototype Oil Shale Leasing EIS.

I believe there is no need or rationality for further oil shale leasing as, 1) the objectives haven't yet been met on Rio Blanca and Cathedral Bluff ventures. 2) Technology is not yet developed enough to be proven efficient, let alone environmentally sound or has it been proven economically feasible. 3) Wait until we have efficient, environmentally, economically sound ways to extract oil from shale, or until we find more productive resources. 4) The established people of the area do not need the bust and boom economy or the socio-economic problems that come with such a venture. 5) Large game and non-game populations would be greatly affected. 6) There would be the problem of top soil being lost. 7) Huge amounts of water would be taken from an already arid West. 8) Finally, the oil shale leases are not practical these leases are being sought under the pretense of boosting industry and creating jobs, which would be slow in developing. Jobs could be created immediately instead in alternative energy research and development. There is also other sources of oil available at this time with out the need for developing oil shale at this time.

For these reasons, I feel and believe oil shale leases are impractical and unnecessary. New ways of looking at energy needs should be approached, other than the oil shale avenue. Please take these issues into consideration when making the decision on the leases.

Sincerely, one of the many concerned citizens of Western Colorado.

Lisa Danning Bird
Rebbie Gonzalez
Janette Pearson
Vernon Kay

Pat Clough
Rich Stocker

Doug Evans

Box 564, Glenwood Springs
903 Bennett #1
Glenwood Spgs CO
903 Bennett #5
Glenwood Spgs Co. 8/601
417 E 23rd #4c
Glenwood Spgs. CO 81601

903 Bennett St. B3
Glenwood Spr. CO 81601

903 Bennett, Apt. B3
Glenwood Springs, Colorado 81601

4908 154 RD
Glenwood Springs CO 81601
Glenwood Springs CO 81602

24
Jacque T. 814 Bennett Gleadow
Luz Shon 418 Blake b.S.
Robert Silvestri 814 Bennett G.S.
Scott H. Bigger 9/2 1108 PITKIN G.S.
Dean Peabody 9/2 1108 Pitkin G.S.

Sept. 4, 1982 25
Colorado Springs, Colo.

80903

409 N. Cascade

oil Projects Team Leader,

I adamantly oppose
any oil shale development on Colorado's
Western Slope. I feel the environment should
not be harmed or destroyed in any way. Colorado
is a most beautiful state. For the natives
and the tourists I would not like to see
any damage to our environment.

The nation does not
need the oil from the shale.

There is oil and
natural gas in Colorado and elsewhere.

I would not
want Colorado's scenery and environment
damaged in any way.

Sincerely,

Barton Hibbard

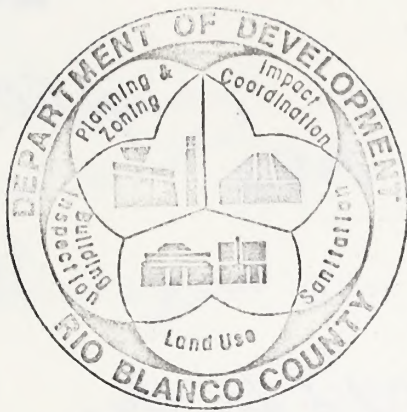
817 Pittkin

Glenwood Springs, CO.
Sept. 5, 1982

Dear Mr. Singlaub,

After reading the Draft EIS for the Prototype Oil Shale Leasing Program, I understand that there are several reasons that the BLM might offer additional tracts for lease for oil shale development. However, after reviewing the original goals of the prototype leasing program, I can also see that not all of these goals have been sufficiently met to warrant the sale of additional leases. Air and water quality are important issues to those of us living in the area surrounding possible lease sites. Since adequate "environmental safeguards and restoration techniques" have not yet been fully developed and we in the area are still not assured of clean air and water, let us not rush into the sale of more leases now.

Sincerely,
Thelma Zabel



RIO BLANCO COUNTY DEPARTMENT OF DEVELOPMENT

Rio Blanco County Courthouse
Post Office Box 599
Meeker, CO 81641
(303) 878-5081

7 September 1982

John Singlaub
Oil Shale Director
Bureau of Land Management
White River Resource Area
Box 928
Meeker, CO 81641

Re: Prototype Oil Shale Draft EIS

Dear John:

Enclosed is an additional statement from Rio Blanco County to be entered into the official record on the Prototype Oil Shale Draft EIS. These comments are a supplement to the comments the BLM received from Rio Blanco County at the Public Hearing August 25, 1982.

We recommend that the following lease stipulation be considered for any future oil shale leasing the BLM undertakes:

The lessee shall prepare and submit to the BLM concurrently with the filing of its mine plan, a socio-economic and transportation impact mitigation study, concerning offsite aspects of the proposed development, which will include a factual statement of the following:

(1) The estimated number of employees the specific lease operation will require during its phases of construction and operation; the estimated multiplied population attendant to that employment; and where that population is anticipated to reside.

(2) Based on information acquired in consultation with state and local government, an analysis of the estimated effect of that population influx upon the county and community infrastructure, including:

- (a) the transportation system at the county and local level,
- (b) the domestic water requirements,
- (c) the domestic sewage treatment facilities and collection system requirements,

John Singlaub

Page 2

- (d) the requirements on the education facilities,
- (e) the requirements the new population will impose upon the fire and police protection systems,
- (f) the requirements that the additional population will make on local government service systems, with primary emphasis upon the normal public works of both county and municipal governments,
- (g) the requirements on the human service system,
- (h) the requirements imposed upon the parks and recreation system, and
- (i) an estimate as to the need, by type and amount of housing which the new population will require on a community by community basis.

(77)

(3) A statement of the immediate impacts and long term effects of mining on transportation facilities within the county, including:

- (a) the estimated transportation mode(s), route(s), and frequency of trips for the extracted resource,
- (b) contemplated construction of transportation facilities,
- (c) the estimated effect of any truck movements on the rate of roadway pavement deterioration, on the design life of the transportation mode, on the level of service repair and on overall safety to the motoring public, and
- (d) a discussion of those measures which can mitigate impact on those transportation modes such as proper signing, lighting, and design or access to and from public roadway(s).

(4) A statement of the perceived roles and responsibilities of the lessee, the affected local governments, and the State of Colorado, relating to the technical and financial needs of the affected communities.

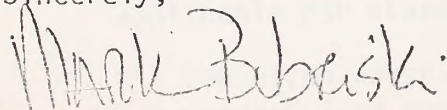
A determination for completeness will be made by the BLM. The Bureau will make this impact mitigation study available to the State and local governments.

The Lessee shall comply with all valid and applicable laws and regulations of Federal, State, and local governmental authority.

Rio Blanco County requests that as part of any future leasing decisions the BLM would require all lessees to meet all requirements of the county permitting process prior to the issuance of the federal permit.

(7)

Sincerely,



Mark Bubriski
Rio Blanco County
Impact Coordinator

MB:ta

75

GARFIELD Board of County Commissioners

28

P. O. Box 640 Glenwood Springs, Colorado 81602-0640 Telephone (303) 945-9158

FLAVEN J. CERISE JIM DRINKHOUSE LARRY VELASQUEZ

September 7, 1982

Mr. John Singlaub
Oil Shale Projects Team Leader
BLM, White River Resource Area
P.O. Box 928
Meeker, CO 81641

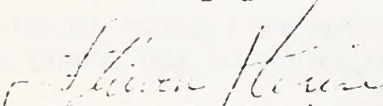
Dear Mr. Singlaub:

In response to the draft EIS on the Prototype Oil Shale Leasing Program, the Garfield County Commissioners would like to once again register their concerns regarding the possible issuance of additional oil shale leases on federal lands in northwest Colorado.

Now, with the possibility of leasing Tracts C-11 and C-18, the concerns center around the phasing of their development and the input that local elected officials will be allowed regarding the socioeconomic effects of such leasing. Oil shale development on federal land, in addition to that which is already being planned and developed on private lands in Region 11, could mean adverse socioeconomic impacts in local government jurisdictions. With four oil shale projects in the early phases of development in Garfield and Rio Blanco Counties in 1981, some local government jurisdictions in Garfield County were experiencing annual growth rates near 100%.

The Board therefore requests that local governments be given the opportunity to provide significant input into socioeconomic impact mitigation programs which should be required as conditions of the leases.

Sincerely yours,


Flaven J. Cerise
Chairman
BOARD OF COUNTY COMMISSIONERS

FJC/ewc

cc: Robert Burford
George Francis

Cathedral Bluffs Shale Oil Company

P.O. Box 2687, Grand Junction, Colorado 81502

September 7, 1982

Mr. John Singlaub
Oil Shale Projects Team Leader
BLM White River Resource Area
P. O. Box 928
Meeker, Colorado 81641

Dear Mr. Singlaub:

The following comments are in response to your request for public comment on the draft prototype Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program. These comments are in addition to and also contain further details to oral comments presented by Robert Thomason in behalf of Cathedral Bluffs Shale Oil Company, the lessee for prototype lease Tract C-b.

Cathedral Bluffs supports the continued development of the prototype shale oil leasing program with its goals of developing an environmentally acceptable oil shale industry and technology demonstration. In addition, we feel that the general leasing program details should be in place ahead of the demand for leases. Once the demand occurs, which could happen overnight due to any number of foreign developments, the resource would be readily available for early production.

Our specific major concerns regarding the Draft Supplemental EIS are in the interpretation of the air quality and water quality data which result in predicting particularly negative impacts. We feel that this has caused unnecessary citizen concern, particularly for those who do not have the available expertise to recognize these problems. The following are our specific comments:

1. AIR QUALITY - (Chapter IV)

A. Model Inputs - Worst Case Assumptions

On page 104 the worst-case model assumptions utilize an input west wind at 4 meters/sec., E stability, which is assumed to be invariant for a total of 24 consecutive hours. The Cathedral Bluffs Shale Oil Project (CB) has conducted an indepth meteorological assessment of its 2-year baseline and found that no persistence was ever attained for E stability with west winds over 10 hours. If this were utilized in the present EIS modeling, results would be reduced to 10/24 of the stated values. Applying this ratio to Table IV-2 (24-hour Predicted Pollutant Concentrations - 2003 High Level Mine assisted In-Situ Scenario) would reduce all the stated exceedances of SO₂ to levels which comply with applicable PSD standards.

(79)
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All too often worst-case inputs are assumed for modeling which are so far removed from reality that they exceed both good statistical analysis and the requirements of the Clean Air Act. Coupled with this is the fact that non-modellers are not familiar with all the limitations of both models and uncertainties in their inputs. Unfortunately, the public

often only sees the bottom line predictions that the proposed project will exceed certain regulatory levels of pollutants resulting in serious negative impacts on air quality. Modeling limitations need increased emphasis; a range of ambient concentrations is suggested in the tabular outputs reflecting modeling uncertainties rather than one discreet value.

(32)
(81)

B. NO_x Values Cited

The only model runs in the EIS document are for 24 hours. The only existing standard for NO_x is an annual standard. Almost always, 24-hour modeling values are higher than annual standards; it is erroneous to compare the two, but this is exactly what the document has done. Increments and standards based on 24 hour periods or less are of questionable value, except where they are specifically health related and have suitable documentation.

(83)

C. Model Use

The TAPAS model is one of the more elegant and useful models in existence and its developers some of the more capable modellers. Nonetheless, TAPAS has not been specifically validated for the Piceance Basin, nor is it an EPA Guideline model for utilization in permitting or compliance functions.

(33)

In PSD applications the EPA suggests use of screening models such as the Valley model be utilized first. Then, only for those conditions that result in high ambient concentrations, runs with more accurate and less conservative rough terrain models such as TAPAS are made to show that standards are not violated. Such procedure was not followed in this EIS. Furthermore, it must be noted that in cases where specific meteorology does not exist, EPA Region VIII uses F stability at 2.5 meters/sec. as a worst case and not the 4 meters/sec. used in the draft document. If this is input to the Valley model, it calculates hourly concentrations and on the basis of a 6-hour wind persistence divides results by 4 to obtain a 24-hour value. Applying this result to the present EIS, values would be 6/24 or 1/4 of those stated in the tables. Also, regarding model use, no annual results are presented, representing an omission on the EIS.

(84)

(85)

D. TSP "Problem"

The EIS states that nearly every town in the study area already violates the TSP standard. It did not clearly state that such violations, in most cases, are due to fugitive dust and home wood burning. It is likely that pollutant dispersion patterns from the various developments will not intersect to significantly impact the TSP situation in those areas.

(86)

In conclusion, the stature of the EIS would have been enhanced had a more realistic worst-case been selected and modeling results acknowledged to contain a range of uncertainty. Another current basin impact analysis states that this uncertainty may be as high as a factor of 10 for 24 hour cases (SAI, Latimer et al 1982, Air Quality Impact Analysis of Synthetic Fuel Development in the Unita

(32)

(82)

7)

models and modelers to step well beyond the state of the art. Moreover when we attempt to predict with these models impacts that are 50 kilometers and more distant, when we know predictions even 10 kilometers are questionable, it is an exercise with no credibility.

2. HYDROLOGY - (Chapter IV)

The simple two aquifer system with open vertical communication between aquifers as generalized from the references used in the Draft EIS is not only inaccurate but produces many erroneous conclusions. The actual field monitoring and data demonstrates a far more complex system. There is a preponderance of evidence that the system is multilayered and highly confining. Permeabilities in the vertical direction are orders of magnitudes lower in the vertical direction than in the horizontal direction. Moreover horizontal permeabilities are extremely low. Strong evidence also exists that there is definitely not complete or even much connection between all but the very shallowest bedrock aquifers and the surface streams. If there were a complete hydrologic connection between aquifers (as stated in the draft EIS), the entire system is already co-mingled as a result of nature rather than development! For much of the basin, particularly near the C-b Tract, we know co-mingling does not exist because the major aquifers differ significantly in quality. (88)

Regarding the subject of leaching flooded retorts, should they ever be flooded, there is now actual information on the nature of modified insitu retorted shale. These data indicate there are mineral changes brought about by the retort process and by the subsequent contact with ground water which reduce the impacts, if any, on groundwater. In particular we refer you to Peterson and Wagner's work at Los Alamos National Laboratory. Subsequent to their June 1981 report, new tests by the authors using ground water for the leaching experiments found that many of the minerals described as mobile in the 1981 report became fixed. These data provide an explanation for the field results being obtained at the Occidental Logan Wash test site which show that the quality of effluent water from spent retorts is returning to the ambient levels of groundwater in the nearby oil shale formations. (89)

Scientific evidence suggests that the rate of water transport in the oil shale formation is orders of magnitude slower than 20-30' per year set forth in the Draft EIS. The measurement is far more likely to be on the order of hundreds of years per mile. This evidence and thesis are set forth in J. H. Birman's paper presented at the last oil shale symposium at the Colorado School of Mines. (90)

For some time CB has been working with Dr. James Taylor of the USGS in conjunction with development of the USGS basinwide groundwater model. Our opinion is that this model in its present form cannot be used to accurately predict impacts. The primary reason is that it assumes open vertical communication between the main surface streams and the bedrock aquifers and that these aquifers provide for the base stream flow. These assumptions are contrary to actual field data. In fact, actual evidence indicates the opposite to be the case. Therefore to even make worst case predictions at (91)

this point using this model cannot be logically or scientifically justified.

We do concur with your comment that mine drainage and dewatering is a complex process and actual rates will only be known when the mine development process begins. Some data concerning this matter are now available and has been provided to the USGS and Dr. Taylor along with suggestions to revise the USGS model assumptions.

In conclusion, there is sufficient data available now on the nature of MIS spent shale, and the complexing reactions which take place when the retorted shale is exposed to ground water. When this data is further modified by dilution, diffusion theories and the confining nature of the formations, they support a no impact prediction. Conversely, at present there are no data to support the negative worst case impact suggested in the Draft EIS.

(92)

3. OTHER AREAS OF CONCERN

A. Net Energy (Chapter IV)

In the final paragraph of this section the Draft EIS cites an additional credit for usable energy in the form of product gas. In the case of mine assisted insitu (MIS) this appears to be greatly underestimated. The net effect in the E out to the overall ratio could be substantial because the MIS product gas processing would generate all the project's input needs and at some times have a surplus for export to the power grid.

(2)

B. Range/Reclamation/Wildlife Comments

In Chapter III, the EIS makes introductory statments that spent shale waste will involve both surface and underground disposal. Other than mine assisted insitu (MIS), at the present time underground disposal is only being considered as an experimental alternative to surface disposal as the most practical and feasible method. The EIS is rather misleading in this introduction, and in a later chapter to imply that underground back filling of spent shale is a viable alternative since the cost will likely be prohibitive.

(93)

The discussion in Chapter III on reclamation of above ground shale disposal embankments, and statements in Chapter IV, p. 128 and 190, appear to limit the reclamation strategy of the proposed tracts to covering embankments with at least 24 inches of topsoil. Since existing topsoil depths average only 15-18 inches on natural areas where disposal will take place, alternative reclamation strategies may need to be employed. This may be especially true due to the potentially prohibitive cost of obtaining and transporting topsoil material from an outside source. Disturbing additional acreages on tract to obtain topsoil doesn't seem feasible since these areas would also require topsoil salvage for their reclamation (that is, the same soil can't be used in two different places).

(94)

The EIS does little to provide the reader with information about alternative reclamation methods. These different strategies could

include such practices as controlled leaching of soluble salts to a point below root zone; applying N & P fertilizers; using a capillary barrier such as a compacted layer of fines; incorporating sewage sludge into upper layers of spent shale; and using different types and amounts of mulches (to reduce surface temperature and evaporation). A combination of methods and soil amendments will provide successful reclamation. These alternative strategies need to be addressed in the EIS. (2)

Revegetated spent shale embankments and disturbed areas may be dominated by perennial grasses and forbs during early years following seeding. In later years (6-7 years following seeding) a change in species composition from a dominance of perennial grasses and forbs to a dominance of shrubs could be expected (Kilkelly, Berg, and Harbert. "Field Studies on USBM and TOSCO II Retorted Oil Shales: 1977 - 1980. 1982 EPA Publication). Species composition in the long term may be effected more by grazing management practices than any other factor. A good management plan will be needed to assure long term revegetation success.

The section on grazing in Chapter IV points out that not all areas will be a disturbed state and thus lost to grazing and wildlife habitat use for the entire life of the mine. This section also states that forage production could be increased for several years following mining. The EIS does not mention that reductions in grazing capacity due to impacts of development could be offset through different mitigation treatments. Such treatments could include: 1) opening up big sagebrush/pinyon-juniper communities through eradication of dense stands (brush beating/chaining/burning); 2) increase forage production and utilization by irrigation and/or fertilization (use of irrigation to dispose of excess mine water during mine development); 3) obtain better utilization of pastures by providing more water developments (storage tanks, water troughs, and springs development); 4) once revegetated topsoil/raw or spent shale storage embankments have become stabilized (5-6 years) these could be opened to grazing; these areas can be 3-4 times as productive as the existing range. These are just a few examples of mitigation practices which have been undertaken at the C-b Tract with varying degrees of success (see C.B Annual Reports 1979 - 1981). It might be interesting to compare lost land from ski area development vs. shale oil development.

C. Additions to the Lease and Environmental Stipulations

1. Regarding the Baseline Assumptions in Chapter I, we have some questions concerning the recommended additions to lease stipulations. To mitigate a main concern, these stipulations appear to create more serious problems. In addition, the wording lacks definition.

- a) On page 19, concerning human-disturbance restrictions on critical deer winter range:

What size limitations will be set. For example, is the limitation to be 200 yards from the area or 1/2 mile? According to the map on page 80, a large number of acres could possibly be restricted during the winter months. (9)

- b) Also page 19, there is a statement prohibiting adverse impacts on deer or elk migration routes.

With regard to deer fences, fencing has been suggested as a way to reduce deer-vehicle collisions. Fencing under this scenario could be considered detrimental to deer in the Basin since it restricts movement across the highway. Obviously this is in conflict with the benefit derived by protecting the large wildlife from road kill.

- c) Page 19, "The nests interfere with resource development or recovery operations."

What constitutes interference? It implies that any nest that cannot be disturbed would be interfering with the recovery operation which certainly is not true.

2. Regarding Chapter II Alternatives, we have the following questions.

- a) Page 33 regarding the statements about short term loss of habitat and carrying capacity of deer:

What is the basis for these figures? Regarding reclamation activities and mitigation projects, the carrying capacity would not necessarily be reduced. The entire 36,000 acres would not be disturbed at one time, therefore the short term losses should be even less.

- b) Page 37. The statement regarding the difficulty of establishing mature shrub and tree species on spent shale piles is not true. Study plots at Colony (11 years old) and Sand Wash (8 years old) show that shrub species can be established and mature growth forms attained on processed shale. Through the use of proper reclamation techniques, species selection, and watering, various shrub species can be grown on processed shale.

- c) Page 141. "Provide lined impoundments between the spoil pile and stream channel"

The design criteria for lining should be specified and justified appropriately.

3. Regarding Chapter IV, we have the following questions and comments:

- a) Page 149. Regarding the statement that shrub production is a limiting factor on the Piceance deer herd:

If browse is considered a limiting factor for mule deer then what mitigation alternatives are being studied? Possibly only certain species are limiting. These species could be used in the reclamation plans to improve the habitat.

- b) Page 150. Regarding the statement that both reclamation and mitigation projects are needed:

This is a good idea, but who is going to recommend the type and extent of mitigation projects necessary? Some method of analysis for measuring success of these projects must be developed. These projects should be coordinated so that mitigation will not result only in isolated patches but rather will be basinwide.

- c) The statement on page 151 concerning human disturbance on deer and elk. It seems that the 0.1 mile buffer zone may have to be more variable; for instance, it may have to be larger in open areas and less in canyon areas.

- d) Page 151. With regard to the deer/vehicle collision problems:

We agree that with the increased traffic load the deer/vehicle collisions may increase, but there are several mitigation options which could reduce the roadkill. For instance: public awareness programs (slide shows, signs), busing, deer reflectors and possibly a railroad. It should be noted that weather conditions and snow depths may have more effect on the roadkills than the volume of traffic.

- e) Page 155. Regarding the factors hunters found enhancing.

It does not seem the oil shale development is going to hurt the solitude factor; those tracts are already overrun by hunters during the hunting season.

- f) Page 189. "Wildlife habitat lost on 310 to 2290 acres due to urban expansion and road construction will be irretrievably lost."

Depending on where this expansion was located the habitat acreage removed may not be such a significant impact, for example building in mule deer winter range vs. saltbrush flats.

- g) On page 190, concerning the section on wildlife mitigation:

The various companies and agencies are already implementing some of these suggested programs including a brush mitigation project, deer reflector study, and collection of roadkill data. Several questions that should be asked are: What guidelines will be used to operate the trust fund? Will it be a one time contribution or yearly? How will the selection of mitigation projects be made? Will all companies and agencies involved in habitat disturbance be required to participate and provide funds? Should these projects have to be restricted to the Piceance Basin? For example, what about improving the summer range outward to Piceance Basin? Finally, before a contributory or tax program could be imposed on the developers, a cost/benefit analysis must be required. We cannot continue to add such costs along with tax burdens on the developers. Rather, since the benefit is to the public, they must also bear the burden.

4. Regarding "Due Diligence"

As with the existing leases, "due diligence" is defined in Section 10 production at various levels consistent only with compliance with the lease terms (page 209, Appendix A). It is respectfully suggested that since mine development may well take ten years plus the two year baseline period, that the lease take into account conditions extraneous to the lease terms themselves in determining whether a lessee is proceeding with due diligence. Examples of such factors are construction costs, oil prices, general economic conditions and the like.

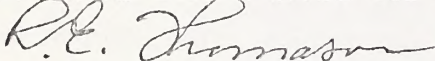
This suggestion does not embrace new legal concepts. As an example, Colorado water law requires diligent development of the water right in order to avoid speculation but this doctrine does not require a water right owner to allocate precious resources to such development at times when such development would be unwise. The purposes of the prototype program will best be met if due diligence is used to prevent speculation (the bonus bid program together with actual on the grounds that lessee-invested improvements already do this), but not to override sound business judgment.

5. With regard to any changes in the existing prototype lease, it is pointed out that specific changes would require detailed review by the lessees and should not be subject to the closing date for this EIS.

With particular regard to the Air and Water Impacts sections, we would be pleased to work with BLM's technical people to resolve the interpretive elements of these issues more accurately. If you have any further questions concerning our comments, please contact Robert Thomason, 303/244-3222.

Very truly yours,

CATHEDRAL BLUFFS SHALE OIL COMPANY



R. E. Thomason, Vice President
Environmental Services

WHL/RET/pmr



GEOTHERMAL
SURVEYS, INC.

September 4, 1982

Mr. John Singlaub
Oil Shale Projects Team Leader
BLM White River Resource Area
P.O. Box 928
Meeker, Colorado 81641

Dear Mr. Singlaub:

I have read with great interest the hydrology section, Chapter IV of the Draft Supplemental EIS for Prototype Oil Shale Leasing Program, Summer 1982. I have some comments which I hope you will accept in the light of our continuing investigations of Piceance Basin hydrology.

The EIS is a fine statement about a complex subject worked on by many highly qualified professionals from the public and private sectors. As would be expected, opinions differ regarding the hydrologic processes and the environmental implications resulting from the mining of oil shale. While what I have to say results from recorded data and direct field observation at these facilities and elsewhere in the Piceance Basin, I owe much to the professional colleagues from both sectors. Some agree and some do not agree with these opinions.

The key question - far more significant than any other aspect of the hydrology - is the extent to which the bedrock aquifers are in communication with the streams and springs in the Piceance Basin. The possibilities are: completely, somewhat, and not at all. The choice among these alternatives generates the hydrologic model, and this in turn determines the baseline and development monitoring facilities, operational design, and mitigation measures.

The EIS states that there is "complete", and later, "perfect" communication between the bedrock water and the streams. If this is true, it must logically follow that:

Mr. John Singlaub
September 4, 1982

1. The entire ground water system is already contaminated by cross-flow and mixing due to natural processes. It can make no difference where and how drillholes, shafts, and underground retorts are constructed. The anticipated impact on water quality is unreal.
2. There are no confining layers within the bedrock system. The retort interval cannot be isolated.

(108)

It seems, therefore, that the measures proposed by the EIS are inconsistent with the basic assumptions.

I think no-one would accept either perfect continuity or perfect vertical restriction of the bedrock water. The consensus is that communication is limited. Some workers believe that there is much ground water flow across the bedrock formations, providing significant recharge to the streams. Others, and I am among them, believe that except where there are great through-going faults, there is very little communication between the bedrock aquifers and the surface. If the views that I represent are correct, careful mining in and beneath the Mahogany Zone of the C-b Tract should be possible without hazard to the usable ground water, the springs, and the streams.

There are several other points on which I disagree with some of the statements in the EIS: Except where the lower aquifer is exposed, I know of no springs that are demonstrated to derive their recharge from the lower aquifer; Because hydrocarbons are removed and refractory minerals are created, leaching of the spent shale in the retorts may be less hazardous than leaching of the natural rock; Depending on a number of factors still to be quantified, rates of transport in much of the bedrock system may be significantly lower than the 20 to 30 feet per year in the upper aquifer as stated in the EIS.

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This letter would be much too long if it contained the data and the arguments on which the foregoing statements are based. I am enclosing a copy of a position paper: Some Questions on Piceance Basin Hydrology which I gave at the Fifteenth Oil Shale Symposium held at the Colorado School of Mines on April 28-30, 1982. That does provide the information as a set of working hypotheses and alternate interpretations subject to modification as we learn more about the Basin. It is for your interest and not intended for inclusion in the final EIS.

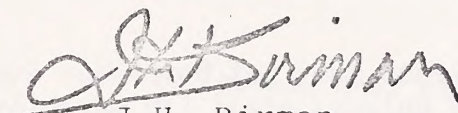
Page three

Mr. John Singlaub
September 4, 1982

I would be pleased to discuss any of these statements with you and your colleagues.

Sincerely Yours,

GEOHERMAL SURVEYS, INC.



J.H. Birman
President

Associated
of Northwest Colorado
Governments



September 7, 1982

The Oil Shale Projects Team Leader
U. S. Bureau of Land Management
P. O. Box 928
Meeker, CO 81641

SUBJECT: Comments of Draft EIS for the Prototype Oil Shale Leasing Program

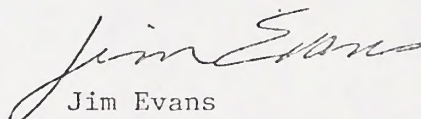
Dear Sir:

These comments are submitted on behalf of the local governments in Region XI of Northwest Colorado. The draft EIS for the proposed prototype oil shale leasing program indicates that there will be serious socioeconomic impacts in the Towns of Meeker and Rifle and the counties Rio Blanco and Garfield.

It is essential that these governments in our Region be assured an adequate process to address these impacts such as now required for the federal coal leasing program. It is strongly urged that the identical process now used for the coal leasing program be adopted for the oil shale program. Any lease should set forth that the lessee "shall comply with all valid and applicable laws and regulations of federal, state and local governmental authority."

Thank you for your consideration of these comments.

Sincerely,


Jim Evans
Director

JE:df

xc: Mayor Darold Hedenscog, Meeker
Mayor George Mitchell, Rifle
Chairman Flaven Cerise, Garfield County
Chairman Allan Jones, Rio Blanco County

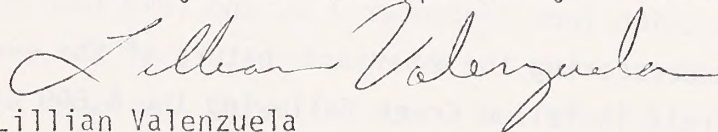
September 7, 1982

Oil Shale Projects Team Leader
Bureau of Land Management
White River Resource Area
P.O. Box 928
Meeker, Colorado

Dear Sir:

The enclosed comments are submitted for your consideration for the final EIS for the Prototype Oil Shale Leasing Program. It was impossible to meet the deadline, but as some of the comments have to do with errors in data used in the DEIS, I hope you will give them your attention nevertheless.

Thank you for the opportunity to contribute to this process.



Lillian Valenzuela

cc: Monte Pasco
Dept. of Natural Resources

J. Pendleton
Mined Land Reclamation Bureau

Re Yellow Creek Instantaneous Discharge September 7, 1978.

I call your attention to a misprint of information on page 73 and 76 of the Draft Environmental Impact Statement. The text quotes high maximum daily sediment discharge from Yellow Creek (Tract C-a is in its headwaters) for period of record 1975-1980 as being 90,000 tons/day. USGS Water Resource records show a high maximum daily sediment discharge for that period as 290,000 tons/day on September 7, 1978. This was the same day as the maximum daily flow of 6,800 cfs mentioned on page 67 of the DEIS. These are extreme fluctuations from the norm for that historically small stream. The DEIS text explains the 6,800 cfs discharge figure as an example of runoff potential from "high intensity localized thunderstorms," but the normal average daily flows range from a fraction of one cfs in the winter to 2-4 cfs during spring runoff months, with a former peak record of only 100 cfs. There was no rainfall recorded at Grand Junction from September 1-6, and .043 inch on September 7, 1978. Further underscoring the aberrant nature of the event is the fact that flows ceased entirely in Yellow Creek following the 6,800 cfs discharge, from Sept. 11-16 (summary data for the year says flows ceased immediately after Sept. 7, 1978); they resumed at a higher than normal rate, with erratic flows for several days. Piceance Creek, which lies within a few miles proximity of Yellow Creek, showed no unusual flows for that day, nor did streams in the southern part of the Piceance Basin. Total sediment discharge for water year 1978 was 290,790 tons/day, 290,000 tons of that occurring on Sept. 7, 1978. Contrast this with total loads of 989 tons/day in 1977, 1,478 tons/day in 1979, and 12,495 tons/day in 1978. (See Exhibits A,B,&C where circled.)

It seems unlikely that the above-described event could be ascribed to "high-intensity localized thunderstorms," therefore, I believe further evaluation and explanation of its possible causes are in order, especially with Tract C-a sited in headwaters of the Yellow Creek basin. Was this a spill from an impoundment or some other system failure? We are, after all, promised 0 run-off; if this has not proved achievable, the affected public has a right and a need to know in order to adequately protect itself.

Anomalous daily sediment flows in Parachute Creek, USGS Water Resource
Data for Colorado

Unusually and erratic flows are shown during winter months, traditionally a time of minimum runoff. Flows are often disproportional to sediment load readings. (See Exhibit D and E where circled.)

Surface water supply impacts

Page 9, "Summary," 4th paragraph:

Re White River flow reduction due to development of both Tract C-11 and Tract C-18--The DEIS text predicts that at a mine production rate of 100,000 bbl/day flows of the White River would be reduced about 4% (about 20,000 acre feet/year). However, interruption of the contributing flows of the Piceance and Yellow Creek tributaries, predicted in the DEIS as a cause of mine dewatering and water table drawdown, and possibly due to storage of water from tributaries leading into those streams, could in itself create a deficit of White River flow of more than 20,000 acre feet. The Piceance Basin Spring Hydraulics Investigation, 1978 (referenced in the DEIS) shows a mean annual runoff of 29,272 acre feet/year for the two tributaries, Piceance and Yellow Creeks, period of record 1965-1972. Streamflows increased beyond this for the period of 1973-1977 in the amount of 7,000 mean annual runoff, producing a total of about 36,000 mean annual runoff in acre feet. (The increase appears to have been due to the detonation of a 90 kiloton nuclear bomb in the Mesaverde Formation in the central part of the Piceance Basin south of Tract C-11 and west of Tract C-b) Interruption of this flow, then, could deplete the White River in that amount.

Additionally, since Colorado water law requires that disrupted water flows be augmented to supply downstream rights, water from dewatering may be used to artificially supply the streams. If mine water is of such poor quality that it cannot be discharged (a likely circumstance at some point as mining progresses) and treatment of it is not practicable, then the White River will be the source to fulfill augmentation requirements. These factors portend withdrawals from the White River of undetermined amounts, but certainly larger amounts than the 4%, or 20,000 acre feet annually, suggested in the DEIS.

(See Exhibit C for 1977-1980 yearly flow and sediment load increases for the four major Piceance Basin streams--USGS Water Resource Data for Colorado. Also, total water budget for the basin has been widely quoted as an average of 70,000 acre feet/year. The last two years shown, 1979 and 1980, show a yearly runoff approaching twice the expected runoff.)

Present and future leasing of gas rights in the Rio Blanco Unit (Tract C-11 and Tract C-11) - State of Colorado 1974 referendum prohibiting withdrawal of gas produced by nuclear gas stimulation.

Following the AEC/CER Geonuclear/Equity Oil Co. attempt to stimulate gas production in the Rio Blanco Unit by detonation of three 30-kiloton nuclear bombs in the Mesaverde formation in 1973, citizens of the State of Colorado voted by referendum not to allow further nuclear detonation for such purposes and not to use gas produced by such means. Gas sampling at the time showed it to contain strontium 90 and tritium as well as other radioactive elements in high amounts. Studies show temperature levels at depths which correspond to the detonation depth to be 200° and over, which implies random movement of the gas by pressure and vaporization. Pockets of water have also been found at these lower strata. The "chimneys" created by the blast have undoubtedly long since collapsed, releasing radioactive elements contained within them.

The wishes of the people of Colorado as expressed by this referendum must be given due consideration before gas production is included as a lease right and before any development takes place. Any current gas production in this area should be halted pending evaluation of health risks to the public and public education and comment.

Water withdrawals from the deep formations of the Piceance Basin, central portion

Several companies have filed applications for deep groundwater rights in the nuclear detonation area. The same considerations must be made in this regard as for gas withdrawals as discussed above.

Impacts of the 1973 Rio Blanco Project nuclear detonation on the rock structure in the deep layers of the Piceance Basin and implications for mineworker safety and mineral and shale production.

Ben Weichmann, President of Multimineral Corp., reported the following in the 1974 Rocky Mountain Association of Geologists Guidebook regarding pre- and post detonation conditions at the Multimineral lease site, and results of seismic monitoring of the site.

Pre-detonation - "Any oil shale mining operation involving the Lower Zone will have to pass through the overlying Leached Zone. The high effective porosities and salinity of the water will create special problems in mine access and water disposal....the shaft grout curtain will have to be carefully monitored to detect the development of cracks. At depths below 2,000 feet, any cracks in the grout curtain that would allow water to enter from the Leached Zone having high transmissivity would be an immediate threat which could result in loss of the entire operation."

Post-detonation - "The data strongly suggest an alteration of the geologic conditions in the Leached Zone, probably an opening of sealed fractures and voids within the zone....Collapse of certain beds in the Leached Zone may have occurred, as evidenced by the immediate flow of sediment in the water from the flowing well."

Contrast the above with the positive note taken in the DEIS regarding similar problems on the subject lease tracts:

"If mining is to take place only in the saline zone (below the Leached Zone), a shaft could be placed through the upper and lower aquifer and properly sealed with grout and water rings, greatly reducing the amount of dewatering that would be necessary....Pilot holes will have to be drilled to test both the quantity and quality of water before dewatering techniques can be developed (Multi Mineral Corp. 1981).

"The saline zone (explored at the Bureau of Mines shaft) was found to be a very tight formation, containing very little water. If this case holds, a sufficient layer of this zone would have to be left above the mine to prevent inflow of water from the lower aquifer. If water was allowed to flow into the mine there would be a large increase in the dissolved solids concentrations of that water. Because very little is known about the hydrologic characteristics of the saline zone, it is not possible to quantify hydrologic effects from mining, beyond the above discussion. (p. 133)

The Multimineral site lies much further away from the detonation site than C-11 and C-18. What "special problems" might they encounter at this closer range? C-b, which lies about 5 miles to the east of the detonation site, has noted its problems with rock structure in deep mining. Shell Oil Co. before them, pulling out of its partnership on the C-b tract, cited weak rock structure as one of the reasons for its retreat.

From the DEIS, regarding C-11 and C-18: "Tract development would probably begin in the Saline Zone with subsequent production from the upper zone shales, principally the Mahogany Zone..." (p. 40)

"Recovery estimate does not include the leached zone, as generally poor ground conditions caused by solution cavities and brecciation would severely limit application of direct mining methods."

(110)

Comments: What does this mean for worker safety--does OSHA have guidelines for dealing with conditions like the above? With resource recovery potential so low by percentage of total deposit on the tracts due to these conditions, can it possibly be economical to employ the refined and sophisticated mining techniques implied by such a combination of weak rock structure and hydrologic conditions? Just how much did the nuclear detonation contribute to these problems and just how much does it factor into resource loss and government compensation?

Additional omissions from the DEIS are listed briefly, but their significance to adequate environmental evaluation is major.

Time context of effects - For example, the DEIS states without elaboration that total dissolved salt concentrations will decrease in certain areas due to mining. This may be true in the lower aquifer, where decreases may amount to 1000 mg/l of seawater levels, which is still pretty salty. It is true in other areas only over the short-term, since leaching over the long-term through underground mines will eventually raise salty discharges to high levels. The mitigation effect in this regard of a backfill of spent shale/cement is not discussed, though this is presented as an optimum ratio.

Subsidence effects: Subsidence potential in relation to water mining is not discussed at all, even though water in the basin has long been a structural component of the basin throughout. Placement of structures, including shale piles, dams, impoundments and reservoirs in the context of potential subsidence is missing. Maybe these engineering problems have been solved, but they appear to be unrecognized issues in the DEIS. All of this is to take place within the confines of the tract, it appears, unless additional land is to be appropriated for waste disposal, dams, etc. Underdrains will be placed in and around shale piles--is the efficacy of such 0-runoff precautions considered in context of subsidence potential due to shale, gas and water mining?

Heat pollution: Will cooling methods under commercial production (2700-3000 tons/hour under Colony's plans) for oil shale heated to 900° be adequate to keep shale waste piles at acceptable temperatures? Will underdrains for streams and run-off be heat protected? What about the potential of heat pollution from steam injection, such as Equity Oil is doing 7 miles west of Meeker, or burning in-situ retorts at commercial levels of production?

Evaluation needed of present damage and changes from baseline from existing operations - See entire preceeding comments for examples.

GREEN RIVER BASIN

09306255 YELLOW CREEK NEAR WHITE RIVER, CO--CONTINUED

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JULY				AUGUST				SEPTEMBER	
1	.48	35	.04	.31	30	.02	.30	30	.02
2	.50	40	.05	.31	30	.02	.30	30	.02
3	.44	25	.03	.25	35	.02	.31	42	.04
4	.42	---	.03	.25	30	.02	.29	30	.02
5	.42	20	.02	.25	30	.02	.29	28	.02
6	.42	50	.04	.25	30	.02	.29	35	.03
7	.41	85	.09	.25	25	.02	500	44000	290000
8	.41	30	.03	.25	35	.02	4.5	10000	122
9	.41	35	.04	.24	50	.03	1.1	---	5.0
10	.42	45	.05	.22	12	.01	.48	---	.10
11	.42	35	.04	.21	16	.01	.00	---	.0
12	.42	45	.05	.22	19	.01	.00	---	.0
13	.39	35	.04	.47	315	.56	.00	---	.0
14	.39	60	.06	.43	---	.10	.00	---	.0
15	.34	20	.02	.39	---	.05	.00	---	.0
16	.41	35	.04	.37	---	.05	.00	---	.03
17	.42	25	.03	.32	---	.06	.21	---	.05
18	.43	30	.03	.32	---	.03	.32	58	.05
19	.41	35	.04	.32	---	.02	.34	51	.05
20	.41	30	.03	.32	---	.02	.34	61	.06
21	.40	35	.04	.32	19	.02	.32	45	.04
22	.38	20	.02	.32	17	.01	.32	48	.04
23	.39	40	.04	.34	68	.06	.30	52	.04
24	.38	45	.05	.33	52	.05	.34	32	.03
25	.35	20	.02	.30	56	.04	.28	33	.02
26	.33	20	.02	.31	66	.04	.28	39	.03
27	.29	10	.01	.30	50	.04	.30	47	.04
28	.29	50	.04	.29	39	.03	.28	46	.03
29	.31	20	.02	.29	56	.04	.25	38	.02
30	.30	40	.03	.30	56	.04	.26	34	.02
31	.31	35	.03	.30	42	.03	---	---	---
TOTAL	12.16	---	1.14	9.35	---	1.53	512.00	---	290127.4
YEAR	825.87	---	290790.09	---	---	---	---	---	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW INSTAN- TANEOUS (CFS) (000061)	SEDIMENT SUS- PENDED (MG/L) (80154)	SEDIMENT DIS- CHARGE SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM (70332)	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM (70333)	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM (70334)	SED. SUSP. SIEVE DIAM. % FINER THAN 1.00 MM (70335)	SED. SUSP. SIEVE DIAM. % FINER THAN 2.00 MM (70336)
FEB										
27...	1125	1.6	334	1.4	87	--	--	--	--	--
27...	1130	1.6	326	1.4	90	--	--	--	--	--
MAR										
10...	1025	2.1	389	2.2	81	--	--	--	--	--
10...	1030	2.1	391	2.2	79	--	--	--	--	--
22...	1045	1.9	12900	68	97	99	99	97	95	93
SEP										
07...	1140	203	52100	28600	95	--	--	--	--	--

LOCATION.--Lat 40°10'07", Long 108°24'02", in NE1SW4 sec.4, T.2 N., R.9E N., Rio Blanco County, Hydrologic Unit 14050006, on left bank 160 ft (49 m) downstream from bridge on State Highway 64, 0.3 mi (0.5 km) upstream from mouth, and 10 mi (16 km) northwest of White River City.

DRAINAGE AREA.--262 mi² (679 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Concrete control since Sept. 18, 1974. Altitude of gage is 5,535 ft (1,687 m), from topographic map.

REMARKS.--Records good except those for winter period, which are fair. Diversions for irrigation of about 300 acres (1.21 km²) above station.

AVERAGE DISCHARGE.--6 years, 1.76 ft³/s (0.050 m³/s), 1,280 acre-ft/yr (1.58 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,800 ft³/s (193 m³/s) Sept. 7, 1974, gage height, 12.97 ft (3.953 m), from contracted opening and flow over road measurement of peak flow; no flow Sept. 7-16, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 25, 1965, reached a discharge of 1,050 ft³/s (29.7 m³/s) by slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,800 ft³/s (193 m³/s) at 1900 Sept. 7, gage height, 12.97 ft (3.953 m), from contracted opening and flow over road measurement of peak flow; only peak above base of 100 ft³/s (2.8 m³/s); no flow Sept. 7-16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978 MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.85	1.1	.48	.75	1.2	1.6	1.5	1.3	.94	.48	.31	.30
2	.85	1.2	.50	.68	1.2	1.6	1.5	1.2	.94	.50	.31	.30
3	.88	1.2	.56	.68	1.2	1.3	1.6	1.1	.94	.44	.25	.31
4	.91	1.2	.56	.70	1.2	1.8	1.5	1.2	.94	.42	.25	.29
5	.97	1.2	.54	.75	1.2	1.8	1.7	1.2	.94	.42	.25	.29
6	1.0	1.3	.52	.80	1.2	2.1	1.6	1.2	.95	.42	.25	.29
7	.94	1.3	.54	.90	1.2	2.0	1.5	1.2	.96	.41	.25	500
8	.97	1.2	.52	.90	1.3	2.0	1.4	1.2	.93	.41	.25	4.5
9	.97	1.0	.50	1.0	1.3	2.0	1.4	1.1	.92	.41	.24	1.1
10	1.0	.90	.52	1.0	1.4	2.0	1.5	1.1	.86	.42	.22	.48
11	.97	.90	.60	1.0	1.4	1.8	1.4	1.1	.84	.42	.21	.00
12	.88	.80	.60	1.1	1.3	1.9	1.4	1.0	.82	.42	.22	.00
13	.94	.80	.60	1.1	1.4	1.6	1.3	.97	.74	.39	.47	.00
14	.94	.70	.60	1.1	1.4	1.4	1.4	.97	.71	.39	.43	.00
15	.94	.70	.60	1.2	1.3	1.6	1.4	.94	.67	.39	.39	.00
16	.94	.62	.56	1.2	1.4	1.8	1.4	.94	.65	.41	.37	.00
17	.94	.60	.60	1.3	1.4	2.0	1.4	1.1	.65	.42	.32	.21
18	1.0	.60	.54	1.4	1.8	2.0	1.2	1.1	.64	.43	.32	.32
19	1.1	.56	.46	1.4	1.5	2.0	1.3	.97	.62	.41	.32	.34
20	1.1	.54	.40	1.3	1.4	1.9	1.3	.94	.62	.41	.32	.34
21	1.1	.50	.40	1.2	1.4	1.7	1.3	.94	.60	.40	.32	.32
22	1.1	.50	.40	1.0	1.5	2.0	1.4	.97	.59	.38	.32	.32
23	1.1	.50	.60	.95	1.7	1.7	1.2	.94	.58	.39	.34	.30
24	1.1	.50	.66	.70	1.8	2.6	1.2	.94	.55	.38	.33	.34
25	1.1	.54	.68	.65	1.6	1.9	1.2	.91	.55	.36	.30	.26
26	1.0	.54	.60	.60	1.4	1.7	1.2	.91	.52	.33	.31	.28
27	1.0	.50	.64	.90	1.6	1.6	1.3	.91	.48	.29	.30	.30
28	1.0	.50	.66	1.1	1.7	1.6	1.2	.91	.49	.29	.29	.28
29	1.1	.48	.72	1.1	---	1.4	1.3	.91	.50	.31	.29	.25
30	1.1	.50	.74	1.1	---	1.4	1.2	.91	.50	.30	.30	.26
31	1.1	---	.80	1.1	---	1.4	---	.91	---	.31	.30	---
TOTAL	30.89	23.48	17.70	30.86	39.4	55.2	41.2	31.99	21.64	12.16	9.35	512.00
MEAN	1.00	.78	.57	1.00	1.41	1.78	1.37	1.03	.72	.39	.30	17.1
MAX	1.1	1.3	.80	1.4	1.8	2.6	1.7	1.3	.96	.50	.47	500
MIN	.85	.48	.40	.65	1.2	1.3	1.2	.91	.48	.29	.21	.00
AC-FT	61	47	35	61	78	109	82	63	43	24	19	1020

CAL YR 1977 TOTAL 409.70 MEAN 1.12 MAX 13 MIN .37 AC-FT 813
WTR YR 1978 TOTAL 825.87 MEAN 2.26 MAX 500 MIN .00 AC-FT 1640

USGS Water Records for Colorado - data for Piceance Basin streams

Measured by water year - October 1 to September 30, designated by calendar year in which it ends.

Discharge (acre feet)

Yellow Creek - near C-a tract.

Piceance Creek - near C-b tract.

Roan Creek - downstream from Logan Wash, Chevron, other projects.

Parachute Creek - Colony located in its headwaters, Union operating just below Colony, with refinery and camp along Parachute Creek.

Piceance Basin (acre feet/water year)

<u>Stream</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Yellow Creek	925	1,640	1,030	2,070
Piceance Creek	10,540	12,710	27,920	29,860
total	11,460	14,350	28,950	31,930
Roan Creek	8,540	35,750	56,610	94,860
Parachute Creek	4,080	21,470	40,300	46,830
total	24,080	71,570	124,860	133,620

Sediment Discharge (tons/water year, except*)

<u>Yellow Creek</u>	<u>Piceance Creek</u>	<u>Parachute Creek</u>
1977 - 989	1977 - 4,123	1977 - 30,287
1978 - 290,790	1978 - 22,729	1978 - 60,455
1979 - 1,478	1979 - 60,158	1979 - 164,277
1980 - 12,495	1980 - 56,115	1980 - 127,345

Roan Creek *(mg/l)

1977 - 19,695
1978 - 35,750
1979 - 221,216
1980 - 498,179

210

PARACHUTE CREEK BASIN

09093500 PARACHUTE CREEK AT GRAND VALLEY, CO--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	3.3	---	.85	9.8	26	.69	7.1	121	2.3
2	3.2	---	.55	9.8	29	.77	6.6	210	3.7
3	3.2	65	.56	9.8	30	.77	6.5	259	4.5
4	3.1	86	.72	9.2	11	.27	6.5	195	3.4
5	3.2	---	.55	8.9	10	.24	6.0	186	3.0
6	3.1	---	.30	8.6	15	.35	5.3	354	5.1
7	3.4	---	.35	8.4	22	.50	4.5	---	9.0
8	4.1	---	.55	8.5	16	.37	4.2	680	7.7
9	3.0	---	.40	8.8	15	.36	4.2	210	2.4
10	4.0	---	.50	9.5	20	.51	4.3	152	1.8
11	3.9	---	.40	10	---	.59	4.4	181	2.2
12	3.9	34	.36	9.2	14600	.63	4.7	720	9.1
13	4.8	28	.36	8.4	2000	.45	5.0	2100	28
14	4.6	33	.41	8.0	163	4.0	5.2	---	50
15	4.7	38	.48	8.4	138	3.1	5.4	---	73
16	5.1	30	.41	8.0	110	2.5	5.7	4180	64
17	5.0	23	.31	7.8	45	1.9	6.3	1610	27
18	4.8	43	.34	7.8	51	1.8	7.2	---	6.0
19	5.0	44	.59	7.8	89	1.9	8.1	---	6.0
20	5.7	51	.78	7.9	84	1.8	7.6	---	6.0
21	6.3	30	.51	7.8	250	5.3	7.8	---	6.3
22	6.1	25	.41	7.5	409	8.3	6.2	---	6.6
23	9.0	21	.51	7.2	---	5.5	8.0	---	6.5
24	12	21	.68	7.0	167	3.2	6.9	---	5.6
25	12	21	.68	7.2	81	1.6	6.7	306	5.5
26	12	43	1.4	6.9	68	1.3	6.6	142	2.6
27	11	44	1.3	6.6	69	1.2	7.4	480	10
28	11	31	.92	6.7	98	1.8	8.5	870	20
29	11	27	.80	6.8	201	3.7	9.4	610	15
30	10	24	.65	7.1	230	4.4	9.9	---	14
31	10	16	.43	---	---	---	9.8	476	13
TOTAL	192.4	---	18.36	244.7	---	525.23	204.8	---	422.8
DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JANUARY			FEBRUARY			MARCH			
1	8.6	390	9.3	8.6	182	4.2	11	310	9.2
2	8.6	236	5.5	8.8	188	4.5	10	320	8.6
3	9.0	200	4.9	8.5	---	3.5	9.4	410	10
4	9.6	320	8.3	7.8	---	1.0	6.8	1870	44
5	10	424	11	7.6	27	.55	8.8	2640	63
6	11	330	9.8	7.6	23	.47	9.6	3200	85
7	11	130	3.9	7.6	24	.49	11	10700	319
8	10	---	4.6	7.8	23	.48	12	28300	917
9	10	124	3.3	8.2	---	.44	12	---	470
10	10	76	2.0	8.6	22	.51	12	4800	156
11	11	53	1.6	9.2	---	.60	12	3250	105
12	12	55	1.8	9.7	---	1.3	13	5800	204
13	12	117	3.8	10	---	1.9	14	6600	249
14	11	78	2.3	10	---	2.6	15	6380	258
15	11	92	2.7	9.8	157	4.2	16	6240	270
16	12	87	2.8	9.4	265	7.2	15	---	230
17	12	90	2.9	9.6	153	3.7	14	---	180
18	12	97	3.1	9.0	64	1.6	14	---	130
19	12	95	3.1	9.8	115	2.8	15	2000	81
20	11	114	3.4	9.3	178	4.5	17	2360	108
21	10	---	3.5	9.3	183	4.6	17	1800	83
22	9.6	---	3.8	9.2	261	6.5	14	4200	159
23	9.2	161	4.0	9.0	302	7.3	14	1280	48
24	9.4	---	4.2	9.3	730	18	14	2660	100
25	9.4	164	4.2	9.9	1270	34	14	2100	79
26	9.1	154	3.8	10	580	16	15	2100	85
27	8.6	184	4.3	11	400	12	16	27000	1170
28	8.5	192	4.4	11	330	9.6	18	24000	1170
29	8.4	183	4.2	---	---	---	20	6800	356
30	7.9	---	3.9	---	---	---	20	3320	179
31	8.2	---	4.0	---	---	---	21	4100	232
TOTAL	312.3	---	134.4	254.2	---	154.94	432.8	---	7557.8

09093500 PARACHUTE CREEK AT PARACHUTE

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER 1979 TO SEPTEMBER 1980

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	4.8	14	.18	14	26	.98	13	46	1.6
2	4.8	6	.08	14	30	1.1	13	20	.70
3	4.4	7	.08	13	21	.74	14	22	.83
4	3.4	8	.07	13	29	1.0	14	27	1.0
5	4.1	12	.13	13	34	1.2	14	30	1.1
6	4.4	12	.14	13	21	.74	14	32	1.2
7	4.4	11	.13	13	33	1.2	13	27	.95
8	4.6	11	.14	14	137	5.2	13	18	.63
9	4.8	19	.29	14	45	1.7	13	18	.63
10	5.0	17	.23	13	20	.70	13	17	.60
11	5.3	13	.19	13	19	.67	13	17	.60
12	5.5	45	.67	12	25	.81	13	46	1.6
13	5.7	21	.32	12	15	.49	13	23	.81
14	6.0	32	.52	12	17	.55	13	15	.53
15	6.0	9	.15	12	18	.58	13	26	.91
16	6.7	9	.16	14	18	.68	13	26	.91
17	7.6	13	.27	14	16	.60	13	25	.88
18	8.4	73	1.6	14	26	.98	13	32	1.1
19	9.8	89	2.2	14	19	.72	14	29	1.1
20	13	9070	465	16	9	.39	14	25	.94
21	12	236	7.3	15	20	.81	15	29	1.2
22	13	118	4.1	15	18	.73	15	36	1.4
23	13	122	4.3	15	21	.85	15	29	1.2
24	13	260	9.1	15	24	.97	15	28	1.1
25	13	206	7.2	15	27	1.1	15	18	.73
26	13	47	1.6	15	21	.85	15	23	.93
27	13	36	1.3	15	38	1.5	15	21	.85
28	13	42	1.5	15	37	1.5	15	37	1.5
29	13	33	1.2	15	67	2.7	15	29	1.2
30	13	38	1.3	14	67	2.5	15	22	.89
31	14	52	2.0	---	---	---	15	22	.89

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JANUARY			FEBRUARY			MARCH			
1	15	16	.65	13	413	4.0	18	180	8.8
2	15	16	.65	13	78	2.7	18	155	7.5
3	14	19	.72	13	41	1.4	18	175	8.5
4	14	19	.72	12	1620	57	19	210	11
5	14	16	.53	13	177	5.2	19	180	8.2
6	14	14	.53	13	75	2.6	19	1030	72
7	14	10	.38	14	52	2.0	21	1510	102
8	14	10	.38	14	79	3.0	19	395	20
9	14	13	.49	14	---	3.0	18	262	13
10	29	10100	1260	14	71	2.7	18	225	11
11	15	200	8.1	14	31	1.2	18	205	10
12	14	150	5.7	13	37	1.3	18	275	13
13	20	734	51	13	77	2.7	18	185	9.0
14	35	4720	710	32	13600	2970	18	154	7.5
15	16	239	10	50	20500	4600	18	162	7.9
16	14	113	4.5	21	2250	143	18	160	7.8
17	14	83	3.1	17	175	8.0	17	136	6.2
18	14	41	1.6	39	19500	1720	18	239	12
19	14	31	1.2	26	2920	243	18	163	7.9
20	14	19	.72	30	8680	1260	17	170	7.8
21	14	36	1.4	20	994	64	18	172	8.4
22	14	36	1.4	22	3540	263	18	205	10
23	14	37	1.4	21	5100	423	18	165	8.0
24	14	59	2.2	18	430	21	18	141	6.8
25	13	36	1.3	18	300	15	19	299	15
26	13	27	.95	17	240	11	19	200	10
27	13	31	1.1	18	230	11	19	265	14
28	13	32	1.1	18	270	13	19	200	10
29	14	35	1.3	18	215	10	19	143	7.6
30	14	153	5.8	---	---	---	19	145	7.4
31	14	177	6.7	---	---	---	19	283	14



August 24, 1982

COMMENTS
of
THE LEAGUE OF WOMEN VOTERS OF COLORADO
on
THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
for the
PROTOTYPE OIL SHALE LEASING PROGRAM
August 24, 1982

I am Hester McNulty speaking for the League of Women Voters of Colorado. Some of our 23 local Leagues are in the region which would be affected by additional prototype leases and they will address their specific local concerns at the Grand Junction meeting.

First the League compliments you for the preparation of a good Environmental Impact Statement (EIS). It is readable, concise, delineates the major issues and analyzes alternatives. We also think, in most cases, the probable impacts are assessed correctly within the limits of existing data.

We have found, however, that there is more recent information on the quality of raw shale lechates than was used in the preparation of the EIS. Laboratory studies have indicated that particular emphasis should be placed on aluminum, boron, flouride and zinc as well as molybdenum in Mahogany mined shales. This study also recommended that sulfur species in the lechate should be determined (Bates, Wolf and McWhorter 1981). We believe the EIS should more adequately address the runoff and lechate from raw shale piles.

The League's preference is for the No Action Alternative. We have chosen this alternative because the EIS indicates that even without additional prototype leases the region could be subject to serious air quality problems and in some cases violate health standards. Moreover, air quality in wilderness and recreation areas would be threatened. Leasing should be postponed until technology either eliminates or substantially reduces emissions from oil shale projects.

LMV/C - 8/24/82

2

However, if the decision is made to lease, it should be consistent with the original goals of the Prototype Oil Shale Leasing Program which were to test the technical, economic and environmental feasibility of differing oil shale technologies. Production should be limited to 10,000 Barrels per Day (BPD) until the technology is proven, the economic feasibility is established and the environmental data is analyzed. Because both tracts would demonstrate the same multi-mineral technology leasing should be limited to one tract.

After eight years of the Prototype Program no technologies have yet been tested. This fact and recent events on private lands should indicate that for the Prototype Program to fulfill its original purpose, a 10,000 BPD limit is desirable. New technology for emissions control could also be developed so that if a larger operation proved to be feasible, the impact on air quality would be reduced or eliminated.

If the decision is made to lease, Tract C-18 was judged to have less severe impacts than Tract C-11 and is therefore preferable. And, if a lease is granted, the environmental stipulations should clarify that state environmental regulations and standards which are more stringent than either federal regulations or law will be complied with. We believe this is necessary because EPA is in the process of issuing weak regulations for environmental programs and there is a possibility that new federal legislation will not protect Colorado's resources - the question of primacy could arise.

We also think the state should be a party to those decisions in the environmental stipulations which are left to the discretion of the Mining Supervisor. Examples are additional air, surface water and groundwater monitoring requirements, the use of pesticides and clean up of hazardous or oil spills.

Finally if the lease is to prove the feasibility of multi-mineral processing then the lease must require the processing and economic recovery of macholite and dawsonite. This stipulation must be added or any reason for the lease will be invalidated.

Dear Sir:

12 Aug 1982

I have reviewed the draft Supplemental EIS for the Prototype Oil Shale Leasing Program. A major flaw is its failure to adequately address mitigation required by Executive Order 11988, Protection of Floodplains. The draft EIS does discuss the fact that floodplains could be impacted, but does not describe mitigative measures that would be necessary should the action take place. Altho site-specific development plans may be lacking at this time, Chapter IV's paragraphs on floodplains do not even address floodplains! Ag lands and alluvial valleys (not floodplains) are mentioned.

(115)

My master's thesis concerned the impacts of oil shale development on the national park system in the Upper Colorado River Basin. Please edit the EIS to remove the frequently-occurring and redundant "immediately adjacent" and "in close proximity". Terrible grammar! (Something is either next to something, or it isn't.)

Please put me on the mailing list for subsequent documents and make this a part of the official record.

Thank You.

David Schein

David Schein

512 Na-Wa-Ta, Mt. Prospect, IL 60056



United States Department of the Interior

BUREAU OF RECLAMATION
UPPER COLORADO REGIONAL OFFICE
P.O. BOX 11568
SALT LAKE CITY, UTAH 84117

OFFICE OF LAND MANAGEMENT
SALT LAKE CITY, UTAH 84117

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IN REPLY
REFER TO UC-150

120.2

SEP 8 1982

Memorandum

To: State Director, Bureau of Land Management, Colorado State
Office, 1037 20th Street, Denver, Colorado 80202

From: Regional Director
Bureau of Reclamation

Subject: Review of Draft Environmental Statement for the Prototype
Oil Shale (DES No. 82-44)

We have reviewed the above draft environmental statement and offer the following comments for your consideration:

1. The stated need for leasing one or two additional oil shale tracts in Colorado is to test new technologies, such as true in situ processing and mining associated minerals concurrently with oil shale. Is there any requirement or incentive that these technologies will be utilized on the new tracts? (27)
2. Flow changes in Yellow and Piceance Creeks as well as the White River are mentioned in general terms. Pre- and post-project monthly flow estimates would provide better information for impact analysis. (116)
3. The statement discusses increases in surface water total dissolved solids, but does not provide estimates of how this water quality parameter would change in the Colorado River system. This is of particular interest to water users in the Lower Colorado River Basin. (2)
4. On page 137, the report indicates that reductions in flow of the White River would be lost for other uses, such as agriculture. Is this meant to mean potential or actual agricultural uses? If appropriate, protection of existing agricultural water uses should be discussed. (117)

We appreciate the opportunity to review this draft environmental statement.

**PIONEERS
HOSPITAL**
OF RIO BLANCO COUNTY
345 CLEVELAND
MEEKER, COLORADO 81641
(303) 878-5047



JOHN M. OSSE
Administrator

September 16, 1982

DIRECTORS

STEVEN D. HARP
President

LYNN K. WHITEMAN
Vice President

LO ANN KLINGLESMTIH
Secretary

EMMA LOU FRISBY
BEVERLY SHAW
SAM F. LOVE
ROBERT H. CRAWFORD

Mr. John Singlaub
Bureau of Land Management
White River Resource Area
P.O. Box 928
Meeker, Colorado 81641

RE: Prototype Oil Shale Draft EIS

Dear Mr. Singlaub,

Thank you for the opportunity to comment on the enviromental impact statement (EIS) regarding the Prototype Oil Shale Leasing Program held at the Fairfield Center in Meeker on the evening of August 25th. After listening to the testimony that evening and reviewing the EIS, I find no mention of potential impact on the medical/hospital services in the Meeker catchment area, as a result I would like to address this aspect of potential impact.

Pioneers Hospital is a county supported hospital licensed for 17 beds with an attached 25 bed skilled nursing home which is operated by the hospital. Of the 17 hospital beds, 11 are general medical/surgical, four are obstetric and two are intensive/cardiac care beds. We are a full service hospital providing services regarding general medicine, surgery, obstetrics, nursery, physical therapy, respiratory therapy, pharmacy, emergency room, laboratory, X-Ray, dietary, intensive & cardiac care, ambulance service, etc. The average hospital occupancy rate in 1981 was approximately 30-35%. This percentage has decreased in 1982 to approximately 20-25% due primarily to the significant cut back in energy development with resulting financial short falls for the hospital. Due to the number of beds however, the average percentage rates may be misleading, e.g., there are days when our patient census may be 90% plus while other days it may be 10% or less. The number of patients in the hospital tends to be higher on Wednesdays and Thursdays as routine surgeries are scheduled for

Mr. John Singlaub, BLM
Sept. 16, 1982
Page 2.

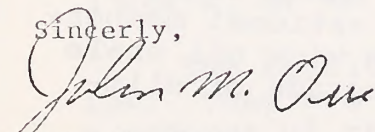
Thursday mornings.

Due to the size of the hospital, the opening of one or two additional oil shale leasing sites and the resulting population, could significantly impact the hospital and current medical staff which is comprised of two physicians, one in general practice and the other in family practice. Any significant increase in activity regarding the current energy sites, i.e., C-a, C-b, Multi-Mineral and Northern Coal could also significantly add to the impact on the medical care system in Meeker. Such impacts could easily require the expansion of the current facility or the construction of a new hospital and the need to recruit additional physicians, nurses and other hospital personnel.

The hospital is currently in the process of developing a planning document with the assistance of consultants, which will address some of these questions and issues. The hospital is also currently involved in addressing the special medical needs which will occur relating to aspects of industrial medicine which will, hopefully, be of benefit to the energy industry, their employees and families, hospital and community-at-large.

I hope this information is helpful. Please contact me regarding any questions, additional information or need for clarification.

Sincerely,


John M. Osse
Administrator

cc: Director of Development
Rio Blanco County



NATIONAL WILDLIFE FEDERATION

NATURAL RESOURCE CLINIC
FLEMING LAW BUILDING
BOULDER, COLORADO 80309

303/492-6552

ROBERT J. GOLTEN
COUNSEL

FRANCES M. GREEN
COUNSEL

21 September 1982

Mr. John Singlaub
Oil Shale Projects
Team Leader
Bureau of Land Management
White River Resource Area
P.O. Box 928
Meeker, CO 81641

Dear John:

The National Wildlife Federation has reviewed the Draft Environmental Impact Statement ["DEIS"] for the prototype oil shale leasing program and would like to compliment you and your team on a document that, in general, is much better than the average DEIS. We appreciate the effort you put into the DEIS preparation and recognize that you produced it under some significant time constraints. We do, however, have a number of serious criticisms of the terms of the proposed Oil Shale Lease and Environmental Stipulations, which we set forth below. In addition to these comments, we also adopt and incorporate by reference the comments filed on the DEIS by Friends of the Earth and the Environmental Defense Fund.

The National Wildlife Federation ["NWF"] has over 4.6 million members and supporters, 20,000 of whom live in Colorado. Environmental impacts resulting from resource developments are a principal concern of NWF. We believe that the protection of the environment is best achieved through reasoned and judicious resource development decisions and that certain areas, due to their environmental quality and natural beauty, are best protected by excluding all development. In this light, the impacts from oil shale leasing and development represent a central issue for our national membership, including our Colorado members, many of whom view oil shale development in the Piceance Basin as certain to degrade or eliminate a significant wildlife resource.

Perhaps our most serious concern is with the possibility that tract C-11 might be leased. The entire tract is critical winter range for mule deer. Moreover, the tract splits in half a larger critical winter range area, leaving only two smaller and unconnected areas in which deer can safely winter in the Basin. It is our view that C-11 should not be leased.

Mr. John Singlaub
 Page 2
 21 September 1982

We also think the terms of the proposed lease are grossly inadequate. First, the lease does not ensure a fair return to the public for its valuable shale oil resources or encourage phased and planned development of the resource to meet the nation's energy needs. In fact, the lease encourages exactly the opposite--speculation in oil shale properties. Second, the provisions of the lease are not strict enough to adequately protect environmental values and, in this regard, do not reflect the conclusions of other sections of the DEIS.

General Provisions

Under Section 5 of the lease, the bonus payment for the lease is payable in five installments, the first being due at the time of sale, the last four being equal installments due each year on the anniversary date of the lease. The lessee, however, is allowed to credit against the fourth and fifth bonus installments any expenditures made by it directly attributable to operations for the development of the leased deposits. While this provision will surely encourage expenditures for development early in the lease term, it does so at the cost of millions of dollars to the public. Moreover, it is unnecessary, since the same result could be achieved by simply requiring development within a reasonable period of time. The "diligence requirements" in Section 10 of the lease, however, do not do so. They require only that a development plan be submitted by the lessee within three years of the lease date. Even then, the failure to submit an acceptable plan does not mean the lease will be terminated. It is only grounds for termination "if the Lessor so elects." The only provision requiring actual development is contained in Section 4 which sets the term of the lease at 20 years "and so long thereafter as there is production from the Leased Deposits in commercial quantities." A lessee thus can hold a lease for 20 years by, at most, only submitting a mine plan. In our view, oil shale leases, like coal leases, should terminate after 10 years unless they are producing in commercial quantities, and there should be a requirement for diligent development and continued operation. In addition, a lease should automatically terminate if a development plan is not submitted within 3 years, or an "acceptable" plan within a reasonable time thereafter.

The royalty payments set forth under Section 7 are much too low. They are based on cents per ton for oil shale, rather than a percent of the value of the shale. [This is in contrast to the treatment of other minerals, for which a percentage royalty is required.] This does not protect the public from inflation or allow the public to benefit from increases in the value of oil shale. In 1976, Congress amended the Mineral Leasing Act of 1920 to require a minimum 12-1/2% royalty for federal coal. The principal concern expressed by Congress was that the cents per ton royalty rate established by the previous law had not resulted in a fair return to the public but, instead, in royalties that decreased, over time, as a percentage of the value of the coal. The same

Mr. John Singlaub
 Page 3
 21 September 1982

reasoning applies to oil shale. Royalties should be established as a percentage of the value of the oil produced.

The royalties section of the lease is defective in at least two other respects. Although minimum royalty payments are required from the sixth year on, regardless of whether any oil is being produced, the lease does not specify the annual production rate to be assumed for purposes of calculating this minimum royalty. Whether the minimum royalty is reasonable, and whether it will have any real effect on encouraging development, obviously depends on the annual production rate assumed. That rate should be the same for each lease, should be reasonable, and should be established in advance of leasing.

(65)

The royalty provision in the lease also allows for crediting royalty payments in the sixth through tenth years against any expenditures made directly attributable to development of the deposits pursuant to the development plan. We think this provision is unwise and unnecessary for the same reasons we objected to a similar provision with respect to bonus payments, as set forth above.

(106)

When low royalty payments are combined with the lack of diligence requirements, the result is an increase in speculation and a woefully inadequate return to the public for its land and resources. These are precisely the concerns that led Congress to amend the Mineral Leasing Act of 1920 with respect to federal coal leasing. The Department has the authority to impose more stringent requirements in oil shale leases, and should do so.

Environmental Stipulations

The environmental stipulations contained in the lease are inadequate in a number of respects. The principal problem--and one that pervades the stipulations--is the inordinate amount of discretion placed in the hands of the Mining Supervisor to approve and establish various environmental requirements, coupled with the absence of any specific standards to provide guidance. For example, the Mining Supervisor is responsible for approving the lessee's comprehensive environmental monitoring program and terminating it where it is in the "public interest." This includes, among other things, deciding how often, where, and what constituents should be monitored to track surface water quality; how many observation wells are needed to test ground water; where air quality monitoring stations should be located; and how far downstream aquatic habitat should be studied. The Mining Supervisor has final authority to approve the lessee's vegetation plan and mitigation measures for areas disturbed during exploration; approve mitigation of damage to fish and wildlife habitat not foreseen in the development plan; specify how a cultural resource

Mr. John Singlaub
 Page 4
 21 September 1982

field inventory is to be taken; determine whether a paleontological appraisal is necessary; determine whether any aquifer is a potentially valuable water supply; approve an erosion control and surface rehabilitation plan; approve a revegetation plan, including species, density and timing; and determine whether the lessee has demonstrated that the required revegetation technology is available. While the Mining Supervisor now has available to him/her a multidisciplinary team at the oil shale office upon which s/he can rely, all of the decisions referred to above (and any others of any significance) should actually be made collectively by this interdisciplinary team and not by the Mining Supervisor. Since MMS's team currently lacks expertise in some disciplines, these decisions should also be made only after consultation with the relevant state agency and only with the concurrence of the Bureau of Land Management ["BLM"], which has considerable environmental expertise. BLM, after all, is ultimately responsible for the surface land under lease. Yet, the proposed lease provides for BLM concurrence with respect to only one decision--the revegetation program. BLM should be directly and substantially involved in all significant decisions made under the lease that affect the environment. It is especially important that decisions at the mining stage be made only after thorough environmental analysis, since no EIS will be prepared at that stage. (114)

Following are more specific criticisms of some provisions of the lease. Under Section 10 of the general provisions, any exploratory work performed by the lessee on leased lands, prior to submission or approval of the detailed development plan, requires only approval of the Mining Supervisor. Given the potential for environmental degradation associated with exploratory work (drilling, blasting, cross-country travel, road construction), a public review and comment period should be mandatory prior to approval of the exploratory work, just as it is for the detailed development plan. (122)

An environmental monitoring program submitted as part of an exploratory work plan (Section 1.(C) of the Environmental Stipulations) may not adequately reflect undisturbed conditions due to the ongoing exploratory work. A monitoring program should begin sufficiently in advance of actual exploratory work to ensure real baseline data. Also, collection of data for one year prior to development may not provide the "true" baseline condition. This should be taken into account, since an accurate environmental baseline is an important prerequisite to a successful reclamation program. (124)

Permitting the Mining Supervisor to terminate the environmental monitoring program when s/he is satisfied that environmental conditions are reestablished following the completion of

Mr. John Singlaub

Page 5

21 September 1982

mining, or earlier if the Mining Supervisor deems it to be in the public interest [Section 1.(C)], implies that reclamation of oil shale wastes has succeeded on a commercial scale (which is untrue) and ignores the fact that certain tree species require more than 100 years to reestablish. The lease fails to mention who is responsible for correcting ensuing environmental problems (e.g., erosion, non-establishment of species, maintenance of plantations) in the interim between cessation of mining and the reestablishment of pre-existing environmental conditions.

Section 11(A), on rehabilitation, provides that all affected lands shall be restored "to a usable or productive condition consistent with or equal to pre-existing land uses in the area and compatible with existing adjacent undisturbed natural areas." The inclusion of the words "consistent with" creates an ambiguity as to the meaning of this standard. Is "consistent with" different from "equal to?" The potential confusion is compounded by the fact that the last sentence in subsection (A) repeats the test, but with the words "consistent with" omitted.

Perhaps the most egregious omissions in the environmental stipulations occur in Section 14 on Waste Disposal. The application of adequate environmental mitigation techniques to spent shale in commercial scale operations is in its infancy. The DEIS acknowledges that the "methodology for revegetating spent shale piles on a large scale basis is in the speculative phase" (p. 149). Yet, not a hint of this is reflected in Section 14. Section 14 implies that spent shale piles can be designed to ensure stability and can be revegetated. Yet, no one is sure this can be done or, if it can, what techniques are best. The Section instructs the lessee to select and prepare disposal sites for wastes so as to avoid downward percolation of leached products and other pollutants into aquifers. Once again, the present state of the art is such that no one knows whether and how ground water can be protected from contamination from spent shale leachates. This is also true with respect to surface water, for which Section 14 provides no protection.

A fundamental underlying assumption of Section 14 appears to be that somehow reclamation methodologies will fortuitously appear to accomplish the goal of protecting and reestablishing the environment. But this is simply an insufficient basis on which to proceed with a massive oil shale project with potentially devastating effects from waste products. We think that Section 14 must contain provisions modeled after those in Section 11(L)(3) on rehabilitation which requires that the lessee demonstrate at the time of submission of a development plan that technology is available to provide revegetation and, if the lessee cannot show the availability of required technology that s/he submit a program designed to obtain the required technology. If the lessee has

Mr. John Singlaub
 Page 6
 21 September 1982

not demonstrated the necessary technology by the tenth year of the lease, operations must cease until the technology is available. We think these principles must be applied not only to revegetation of mine waste, but to slope stability, erosion, and contamination of surface and ground water from spent shale leachates. If the lessee cannot demonstrate that the required technology is available, and works, then development must cease. The potential for significant and perhaps irreparable harm is too great for any less stringent requirements.

We also take exception to another assumption apparently underlying the DEIS--that the government is eventually going to be responsible for waste disposal. The DEIS states on p. 189 that "[u]pon decommissioning of mine facilities, monitoring and maintenance of waste disposal piles may become the responsibility of the federal government should the company refuse to continue monitoring the maintenance activities due to the expense." The government should never have to be financially responsible for the waste disposal piles. The lease should expressly require the lessee to assume responsibility for waste disposal piles after decommissioning and until monitoring and maintenance is no longer necessary. A substantial bond should be required to ensure that if the lessee ignores its responsibilities, it will not be at the public's expense.

(121)

Conclusion

Unfortunately, the Department of Interior's rush to lease land for oil shale mining has minimized reasoned debate regarding how best to proceed in reviewing oil shale development proposals and evaluating strategies for dealing with long-term environmental impacts. Given the magnitude of the environmental consequences contemplated for oil shale development in the Piceance Basin and the uncertainty of its impacts, we recommend the following actions. First, certain changes should be made in the Oil Shale Environmental Advisory Panel to help it function more effectively. Environmental interest groups should be represented on the Panel. They are not now, which, in our view, is a serious oversight. The Panel should also elect its own chairperson and hire its own staff. And, the Panel should undertake responsibility for reviewing research design and environmental monitoring programs and advising lessees on research procedures and results. Many state and federal permitting agencies have need of current environmental research information as well as a forum for factoring their data needs into the research process.

(122)

Second, in conjunction with the oil shale Advisory Panel, and to foster the widest dissemination of information to the broadest spectrum of Colorado citizens, we recommend that the

Mr. John Singlaub
Page 7
21 September 1982

lessees be required to present an annual report to the citizens of Colorado at a series of public meetings hosted by the Department of Interior. We expect that a citizens' advisory committee and an annual report to the citizens of Colorado will help to supply some of the missing links in the oil shale development dialogue.

We appreciate the opportunity to comment on the DEIS for the prototype Oil Shale Leasing Program, and we look forward to your response to the issues presented in this letter.

Sincerely,



Frances M. Green
Counsel

dh

FRIENDS OF THE EARTH

COLORADO OFFICE

2239 EAST COLFAX AVENUE ROOM 209

DENVER, COLORADO 80206

(303) 322-2791

22 September 1982

Hand Delivered

Mr. John Singlaub
 Oil Shale Team Leader
 Bureau of Land Management
 P.O. Box 928
 Meeker, Colorado 81641

Dear John:

Attached please find Friends of the Earth's detailed comments on the Draft Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program. The Bureau and your team have done a creditable job in preparing the EIS. It is not without problems, but far surpasses the documents we have come to expect in past years.

Many of the deficiencies of the environmental statement and the proposed program arise from the haste with which the Bureau has wished to implement new oil shale leasing. Originally DOI proposed to commence planning for new prototype leasing in August of 1980, ending with a lease sale in August of 1983. Preparation of this program commenced early in this year with scoping and tract nominations. Leasing is now planned in January, 1983 -- a one rather than a three year schedule.

Suffering the most from this compressed schedule is land use planning. Basing the proposed action on the existing Management Framework Plan has unduly constrained the choice of alternative actions. Several other deficiencies affect the viability of the proposed action:

- o Despite the intent to lease to test multi-mineral oil shale extraction technologies, the lease does not in fact require full recovery of all resources which will ensure multi-mineral extraction. (27)
- o The mitigation measures proposed for socio-economic impacts are woefully inadequate despite the seriousness of the effects predicted by the environmental statement. (124)
- o Environmental mitigation measures also do not measure up to the impacts which are necessary to avoid or minimize.
- o The maturity of the technologies proposed for first-of-a-kind commercial development here is not demonstrated. This will probably lead to another failure for the Prototype Program. One (19)

sign of the lack of maturity of the technologies is the low resource recovery which is anticipated.

o The economy does not favor shale development presently. Leasing will probably attract inadequate lease bonus revenue -- a problem for the oil shale region's communities as well as the nation's taxpayers. Leasing at this time will only raise false hopes in Western Colorado without any substantive improvements in the industry or the economy there.

(16)

o As mentioned above, the proposed action falls within the scope of the existing, obsolete Management Framework Plan (with possible exceptions which we note in our detailed comments). This unduely restricts BLM's choices among potential locations for multi-mineral experimentation. Neither proposed lease tract may be the best for the proposed action based on true multiple use criteria.

(125)

o Finally, the environmental statement reveals serious environmental and social consequences of the proposed action. These alone should probably be fatal to the action as currently proposed.

As result, Friends of the Earth recommends that the Bureau postpone any multi-mineral leasing until the Resource Management Plan for the Piceance Basin is complete and a new lease can be found which will avoid the problems associated with either C-11 or C-18.

If the Department feels that it cannot delay action to encourage multi-mineral leasing, it should lease only tract C-18 and it should adopt the additional mitigation proposals contained in our detailed comments.

We would like to thank Ellen Hirschberg Geier and Charles Griffith for their assistance in preparing these comments.

This submission corrects and amends the version of our comments submitted on 21 September 1982.

Sincerely,

Kevin Markey
Colorado Representative

Connie Albrecht
Colorado West Representative

Detailed Comments by Friends of the Earth
on Proposed New Prototype Oil Shale Leasing

Because of the impacts anticipated for the action proposed by the Draft Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program, and because of deficiencies in land use planning, proposed mitigation measures and terms and conditions in the proposed prototype oil shale lease, Friends of the Earth believes that the intended action should be postponed and be reconsidered after preparation of the Resource Management Plan for the Piceance Basin. These comments will detail our concerns.

Inadequate Land Use Planning

To speed leasing to test multi-mineral extraction technologies, the Bureau of Land Management (BLM) has chosen to base its proposed action on the existing Management Framework Plan for the White River Resource Area. We do not believe that this document offers an adequate multiple use basis for oil shale leasing decisions. By BLM's own admissions in discussions with Friends of the Earth during the past years, the MFP does not consider regional conflicts, only site-specific, has a non-existent social resources component, lacks adequate water and air quality baseline, and does not adequately integrate mineral resource conflicts.

Our review of the MFP reveals additional problems. Most serious is the basis for the minerals recommendation that eight oil shale tracts be available for leasing (with their restriction to new technologies). The recommendation was based only on geologic and mineralogical criteria without regard to other resource conflicts. The MFP did, in fact, identify many site-specific resource conflicts. One of the most serious was the conflict with critical winter range for the White River deer herd. These conflicts do not affect the ranking of the proposed oil shale tracts. Regional conflicts such as air quality and social conflicts of all sorts are ignored by the MFP.

To be consistent with legal requirements, the BLM limited the scope of its call for industry expressions of interest to the eight tracts identified by the MFP. It also added the sodium lease tract, claiming consistency with the MFP. (We are not as confident as BLM that the inclusion of the sodium lease was in fact consistent with the MFP).

Being limited in this way, to tracts originally identified by nominations more than a decade ago, to tracts ranked only according to geological criteria, seriously constrains BLM's range of alternatives. As an example, consider tract C-1, ranked number VIII in the MFP. Its location further north may help avoid serious cumulative air quality impacts with tract C-a under a westerly wind; its location closer to Rangely may help offset the burdens of population growth on Rifle and (possibly) Meeker. It does not conflict with critical deer winter range, although

(126)

(125)

its remote location has been conducive, according to the 1973 Prototype Leasing EIS, to a very diverse wildlife population. Yet, its mineral potential is reportedly limited. Is there another, more minerally promising tract with some of the advantages of tract C-1? The range of possible alternatives in the EIS does not at this time permit an answer to that question. Moreover, by limiting the scope of review in the EIS to industry nominations, BLM cannot even address the potential advantages of C-1 relative to C-11 or C-18.

Other conflicts are also ignored by the EIS. Although FOE does not support open pit extraction over other options -- we do not believe adequate information exists to judge among technologies today -- BLM should not eliminate future high-resource recovery options by decisions today. Tract C-11 is within the area which may eventually be open pit mined (overburden/ore ratio is less than 1 for 25 gpt shale). Tract C-18 mostly avoids this area, but if the cutoff grade becomes 20 gpt, C-18 may be able to be partially open pit mined. These conflicts were not considered in the MFP, and they are not analyzed in the present EIS. Underground mine workings, together with the problems associated with the leached zone, may make future surface mining difficult or expensive. The EIS should at least evaluate lease terms and conditions which will require backfilling to mitigate the loss of resources and allow future mining in the unmined portions of the proposed leases. (127)

BLM is also handicapped by the lack of selection criteria adopted in advance of its leasing and tract selection process. The adoption of preliminary tract selection criteria was originally proposed by the Undersecretary's Oil Shale Tract Force, but was dropped in BLM's present haste to lease. 8)

Thus, we believe that BLM should postpone its decision on this lease, evaluating alternatives after the completion of the Resource Management Plan.

Socio-Economic Impacts and Their Mitigation

Human Service Analysis Deficiencies

The environmental statement reveals serious problems will result from already proposed shale projects and from the intended action because of community impacts. However, the statement is still deficient in its analysis. BLM is particularly negligent in its proposal of ways to mitigate impacts which it admits will be severe or very severe.

It used to be fashionable to overlook the analysis of socioeconomic impacts because of all the "intangibles" involved -- a tangle of complex problems that simply cannot be quantified. Unfortunately for BLM, this is no longer the case. There now exists an arsenal of resource material. Rather than providing a complete bibliography, we would reference the bibliography attached to the Garfield County 1982 Human Service Delivery Plan as an example of the body of literature not drawn upon by this EIS. 0)

Considerable data and state-of-the-art analysis such as this is ignored by the analysis in the EIS. Two other documents demonstrate the state of socioeconomic assessment techniques which BLM should be using: the Chevron Shale Oil Company Clear Creek Project's socioeconomic assessment and existing conditions prepared by BMML and the Garfield County 1982 Human Service Plan. The inadequacy of the EIS can be properly measured and corrections guided with either document. Now to specifics:

Social problems are insufficiently addressed and presented in a whimsical fashion in the narrative and in a theoretical manner in Table IV-18, masking the grave negative consequences of boomtown problems that will befall old-time residents. We are told that at full production, "some permanent negative effects would have occurred, some lives would have been touched by marital disturbances or divorce, ...some of the elderly and the young would suffer from losses of social support systems. There are winners, impacts would be short term. ...In the long term, many of these problems give way to beneficial effects -- housing and infrastructure improvements, diversification of retail and services..." [Emphasis Added]

The question that was not asked and the analysis which is missing is "who are the winners and who are the losers?" No income or age breakdowns are provided on existing residents in the region, so that it is impossible to assess the potential human damage among the residents. According to a 1979 Colorado West Area Council of Governments (CWACOG) housing study, 15% of the residents in western Garfield County were elderly, either in the "low" or "very low" income categories. U.S. Bureau of Census data on per capital income, median income and distribution of household income for the three county area all indicate that historical income levels are low.

Had a complete profile been provided, presenting these and other facts such as rental price estimates, it would be plain to see that the majority of old time residents would be the "short term" (and possibly long term) losers. As was the case in Parachute during the summer of 1981, short term pressure became so severe that long term residents fled during the peak of the boom, leaving "long term" benefits to financially well-off newcomers who had the means to rise above it. The casual conclusions made in the narrative are without factual basis. Demographic characteristics of the regional population, such as age, sex, racial/ethnic composition, income and educational attainment need to be considered at the very least, before analyses can be made about the benefits of these alternative actions.

Table IV-18 indicates that certain groups may experience problems, but no detail is provided on what those problems may be. While data exists on such difficulties as child abuse increases and juvenile crime increases in Garfield County, there is no survey of social problems provided by the author's of the EIS. Nor is there any information on service utilization levels experienced thus far in the 3 county area as a consequence of boomtown growth. Such is the case, even though this data is

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easily available in the documents mentioned above. Also missing is data describing social problems experienced in other areas of the country, state and region, such as Craig and other Rocky Mountain energy boom communities. At the very least, currently available data on the frequency and type of social problems and service utilization in Garfield County needs to be reevaluated to provide a realistic assessment of who will be the beneficiaries and the victims of the proposed leasing program.

The EIS should also evaluate the human service capabilities of the affected communities -- health care, social services, mental health, recreation, youth services, senior services, etc. Social problems and human service needs should be forecasted in the EIS and monitored on a continuous basis by the lessees as a stipulation of their lease.

(130)

Cost and Manpower Analysis Deficiencies

The EIS makes no projective assessment of the demand for capital brought about by the various alternative actions. Nor is there any effort to identify the consequences of private market failures. While tremendous problems could result, as they did in Colony's situation, from shortages and inflation in the housing and commercial sectors, no detailed analysis is provided to show who is responsible for providing housing and other private venture capital. Tables indicate potential public revenues, but not in relation to total needs, both public and private.

(124)

There is likewise no effort to identify detailed public sector costs generated by the alternatives. Data on prospective public sector revenues is meaningless outside of this context, without any comparison with increased cost estimates, broken down by county and community.

(118)

There is no detailed analysis of manpower needs or the availability of local labor needed for each proposed alternative action. The omission results in underestimation of the size of the in-migrating workforce because the authors falsely assume that many construction jobs will be awarded to local laborers. However, without labor data broken down by skill, there is now way the local area can prepare people to compete for these skilled jobs. The Denver Research Institute (Gilmore & Stenejem, Oil Shale Development: The Need for and Problems of Socioeconomic Impact Management and Assessment) found that 1.5% of the Wheatland (Laramie, Wyoming) workforce originated locally, while a 20% local workforce had been forecasted. Some numbers are available from C-b, Union and Colony on origin of workforce. Informal interviews with Parachute residents during the summer of 1981 indicated that the same situation existed with respect to Colony hiring of outside workers. (One must be careful, however, of the methodology used by companies in determining origin of laborers in their surveys.)

(131)

Considerable attention has been given the work of the Cumulative Impact Task Force recently. However, its work has not yet been subject to public scrutiny. The coordination and standardization

of impact assessment by the CITF may be a valuable tool in the future once the bugs are worked out of the system. Lease stipulations should require the use of CITF consistent methodologies. Initially the EIS should include CITF data so that it can be publicly evaluated and compared with BLM's analysis.

(132)

Proposed Mitigation Inadequate

Despite the deficiencies of its analysis, the EIS does recognize the potential gravity of the social and economic impacts of the proposed alternative actions. However, despite this recognition and the possibility that after the full analysis recommended in our comments more serious problems may emerge, the proposed lease and other committed mitigation is woefully inadequate.

This deficiency is more serious because of the possible federal preemption of local land use law under the Mineral Leasing Act (Ventura County v. Gulf Oil Corporation). While there are still legal disputes concerning the extent of this preemption, the consequences of not fully acknowledging the necessary role of local governments in determining the best mitigation strategies cannot be overlooked. Therefore, BLM must and should acknowledge the role of the local government in lease stipulations.

Friends of the Earth proposes several approaches to deal with mitigation deficiencies:

(77)

o The lease should require the agreement to a mutually acceptable mitigation plan by the three or four most important parties: (1) the lessee(s), (2) all significantly affected local governments, (3) the State, and (4) the BLM as a condition for approval of any proposed detailed development plan. The BLM's presence as a party to the contract would be necessary to enforce its terms as part of the terms of the lease. Any violation of the plan would be a violation of the lease.

o The socioeconomic "assessment report" required by Section 15 of the environmental stipulations of the proposed lease, while a step in the right direction, should be a full socioeconomic mitigation plan, consistent with our suggestion above.

o The lease should include an additional section which requires the lessee to pay advance royalties, creditable to royalties which actually become due later under section 7, as the Secretary or the Mining Supervisor determines they are necessary to meet front end socioeconomic costs of affected communities to the extent that other revenues do not meet those needs. This determination should be made at the request and with the consultation of affected local and state governments.

(133)

o Other economic terms and conditions of the lease should be improved (see below) to result in adequate revenues to meet local needs.

o The proposed action ignores most of the excellent recommendations made by the socioeconomic subcommittee of the Undersecre-

tary's Oil Shale Task Force in 1930. These recommendations should be added to the lease terms and conditions: (1) transport plans for employees, products and materials, (2) coordination and consultation with local government in approval of the detailed development plan, (3) specific requirements for monitoring social variables, (4) compliance with all state and local laws and ordinances to the extent that it would not interfere with the purpose of the lease, (5) a coordination mechanism for cooperative impact mitigation, plus BLM actions outside the leasing process.

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o Also, BLM should require the filling of detailed real-time labor data and the provision of training for local residents to ease in-migration.

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The history of energy development in the West indicates that if socioeconomic problems are not avoided, in advance of development, not only will the suffering of individual residents be increased, but the developer will experience reduced productivity, higher costs, and long delays. DRI (op cit, above) found that construction productivity can be reduced as much as 35%. This does not mean that BLM can rely on each company's self interest to enforce good planning and mitigation. The history of western energy development is rife with examples of companies who ignored their best interest, to their own detriment, and more important, to the detriment of the community.

In discussions during recent BLM hearings, industry representatives responded to these suggestions not too friendly. They suggested that there would be an administrative usurpation of legislative prerogatives for BLM to require the mitigation plans which we herein propose. We do not agree.

In particular, Ventura v Gulf provided that a decision to lease was not only a legislative decision, but that the Congress authorized the leasing of oil by an administrative agency and the local government could not reverse that administrative decision. If BLM decides, administratively, to share some of its police powers with local governments in order to make its leasing actions more socially sound and (ultimately) economically sound, there is nothing to stop it from doing so. Moreover, the presence of BLM in any negotiations with local governments, and proper drafting of lease language to require the contract we propose, can reserve to BLM adequate safeguards of its decision to lease.

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BLM's "No-Action" Assumptions

It is reported that industry has severely criticized BLM's base-line oil shale industry growth assumptions which it used in evaluating the impacts of the "no action" alternative. We cannot agree with this criticism. Also, we think that BLM's "warnings" to the decisionmaker to take into account the current depressed state of the oil shale industry is misguided.

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First, just as economic conditions have rapidly changed to depress the future of the oil shale industry, so they can (and have in the past) just as quickly reversed to encourage unmanageable growth. Just a few months ago Exxon was touting the benefits of a huge multi-million barrel per day shale oil industry. Today, Exxon's Colony project is in mothballs. Tomorrow could quickly reverse this.

Friends of the Earth is presently preparing an economic assessment of the future of the oil shale industry. We regret not being able to share the entire report with BLM, but can report some preliminary conclusions. The conclusions, actually, should come as no surprise, but should be noted and considered.

The three most serious barriers to the shale industry are high interest rates, flat oil prices, and high technical uncertainty which demands high rates of return for these projects. Reduction of interest rates requires action by the Federal government to reduce deficits. There is finally some movement in this direction (although, in our opinion, at the expense of the wrong sectors of the economy) and interest rates have at least temporarily started to decline and stabilize.

Oil prices depend on international affairs and the success of world-wide conservation efforts. Depending on the cost of the project and the interest rates, an average annual compound growth rate of 3-6% in oil prices could be sufficient to spur the industry once again.

Finally, high required rates of return made be reduced by actions by the Synthetic Fuels Corporation and by the experience of early synfuels projects.

Together, these conditions may in fact obtain. However, even if they do not occur for many years, they are likely to occur suddenly and affect all projects simultaneously. Thus, the decision by BLM to evaluate what many may think will be the "worst case", may in fact be the only case. It is true that the actual effects may not be felt in the years predicted by the EIS (whether social or environmental in nature). However, it is quite possible that all the projects, plus the leases in the proposed action, will see simultaneous development. The consequences will therefore be consistent with the presently proposed no-action baseline and other proposed actions.

BLM's planning regulations also require the agency to assume a "worst case" analysis whenever uncertainty makes a more definitive analysis impossible or inappropriate. This is certainly the case here. In fact, BLM's assessment is not the "worst case." Present shale company resource holdings can support a much higher daily production rate. The size of the proposed leases could also support higher production than that assumed in the EIS's analysis.

Technology Assessment Needs and Stipulations

The only significant argument in favor of leasing a new prototype lease is the need to test multi-mineral extraction techniques. However, the lease does not now require the maximum economic recovery of all minerals, including oil shale, nahcolite, dawsonite, halite and other sodium minerals. This is a serious, and for any hope of our support for this program, a fatal flaw in the proposed action. Often BLM officials have argued in meetings where we have discussed this issue that the agency cannot stipulate the use of any specific technology. This is not what Friends of the Earth proposes. We only wish to see an enforceable provision which will prevent a lessee from abandoning the testing of this new technology in favor of continued speculative holding of the land for more primitive techniques. The most effective provision would be a requirement of conservation -- maximum economic recovery -- of all minerals covered by the oil shale and (if applicable) sodium leases.

(27)

There is in any case no need for two tracts. On environmental grounds BLM's choice, if not the no-action alternative, should be C-18. On other grounds, too, the choice should be limited to that tract because of the surface mining potential for tract C-11 and because there is not more than one mature technology ready for prototype testing.

We would remind BLM of the dictionary and its own definition of the word "prototype": "first of its kind commercial scale." It is quite clear that Shell's process, proposed in its expression of interest, is immature for a commercial test. Shell claims that is due to the lack of suitable land to test its concept. If this is the case, the EIS should instead evaluate the concept of the "research lease." We have not fully formulated our own thinking on this idea, but the lease would be no larger than that necessary to test new technologies, and might be leased in conjunction with the Department of Energy's oil shale R&D program (but not in conjunction with the Synthetic Fuels Corporation, which is a commercialization agency). Only semi-works scale operations would be allowed, and maybe several tests could take place on the same parcel. Without this option, suggested in our scoping suggestions, the EIS is inadequate in its range of alternatives.

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There is also doubt about the maturity of Charter's multi-mineral process. The low resource recovery anticipated for each tract is a sign of the relative unreadiness of these processes. As we suggested in our scoping comments, BLM should at least assess the maturity of these technologies prior to making a decision. The consequences of not doing so is to invite another prototype program failure. Tracts C-a and C-b, initially proposing more mature technologies, have not yet seen development, in part because they were less mature and economically sound than originally expected. The Synthetic Fuels Corporation has developed several criteria for assessing maturity. We urge BLM to use them at the leasing step (assessing preliminary development plans prior to accepting a bid), at the EIS, and at the time of approving the detailed development plan.

Economic Lease Terms and Conditions

The EIS states that most of the terms and conditions established for the Prototype Program in 1974 will be retained in the new proposed leases despite comment during the scoping process suggesting changes. We think this is shortsighted and wrong. Errors contained in the 1974 leases shouldn't be perpetuated in the guise of experimental purity. One of the goals of the prototype program is to develop management expertise in leasing. Continuing old mistakes does not promote this goal.

One of the most serious errors is the royalty rate assigned oil shale. If one assumes that the average grade of shale is 27 gallons per ton mined, and if one further assumes that shale oil prices are the same as the regional price of petroleum, the old lease and the new ones would result in a royalty rate equivalent to only 71 cents on a \$35 barrel of shale oil, about 2.053% of the value of the shale oil. This is inadequate. The final useable product of a coal lease must pay a royalty equivalent to 12.5% of its value. An oil lease requires a royalty equivalent to 1/6 of its market value. Shale oil is the last public liquid hydrocarbon resource. It should not be given away.

The reason for the low royalty rate is simple, as we are explained it by some DOI officials and as we view the history of the prototype program. When the royalty rate was first proposed prior to the publication of the draft prototype EIS in 1972, the price of oil was (according to the MMS Oil Shale Office Royalty Manual) only \$3.13. The royalty was set on a tonnage basis to approximate a 5%-of-shale-oil-value using this information. Unfortunately, by the time the lease became effective in 1974, the regional value of oil climbed to \$6.82 (id.). Yet, the tonnage royalty was set in concrete based on the earlier \$3.13 per barrel oil price.

(119)

This error should be changed, at least increasing the tonnage royalty rate to 26 cents per ton for 30 gpt shale, retaining the 1974 oil value index. This is probably still too low, but it will be a step in the right direction.

Diligence provisions of the lease are still inadequate. The past several year's experience should attest to that. They are an ineffective combination of withered carrot and broken stick. For example, the bonus and royalty credits are too low except to encourage some initial spending on tract to avoid these payments but not high enough to actually result in diligent production. It was always a mistake to credit bonuses and royalties with on-tract expenditures instead of actual production royalties. This should be changed.

The broken stick consists of the lease's provisions to require commercial production by the twentieth lease year. As demonstrated in the recent changes in the C-a lease, which we have protested, this is easily revised without so much as adequate public notice.

Diligence provisions are important to ensure an adequate return to the public and to obtain the principal benefits of the prototype program -- experience with new technologies. Without diligence, new federal leases will raise false hopes among a population eager for anything to pull it from its recent economic falls.

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We would suggest changing the offset procedures to allow advance and "minimum" royalties to be credit only against royalties which result from actual production. BLM should eliminate the bonus offsets. The present economic situation will probably minimize the size of bonuses, limiting the amount of revenue available for socioeconomic mitigation. Bonus offsets will only reduce this further. In their place, BLM should establish several milestones which must be met to comply with diligence terms in the lease. BLM should also increase the rate of production of recoverable reserves of shale oil assumed in determining "minimum" royalties in the lease from that which was assumed in the 1974 leases. Together with a higher basic royalty rate, this should create adequate incentive for lessees to produce or get off the lease.

EDF v Andrus Requires More Detailed Analysis
of Site-Specific Mitigation Strategies

The consequences of the district and appeals courts decisions in EDF et al v Andrus et al are considerable for BLM. The court ruled that the original leasing EIS is the document by which the Mining Supervisor will judge the adequacy of mitigation and other alternatives assessed at the time of detailed development plan approval. This is a considerable burden, but it means that your document can be challenged if it does not adequately assess those alternatives. Missing, for example, now, are assessments of alternative air pollution controls, alternative site plans, alternative water augmentation plans, alternative water pollution controls, and the like. BLM must analyze these alternatives. We further reference the comments of the Environmental Defense Fund on this matter.

(138)

IIS Is Not The Same As MIS; It Has
Some Additional Problems Which Need Analysis

Integrated in situ. proposed for development by the Multi-Mineral Corporation, is not the same as the vertical modified in situ techniques developed by Occidental Petroleum Corporation. As a result, many of the impacts may not be the same as for the so-called "mine-assisted in situ" cited in the EIS.

Occidental claims that high temperatures of retorting render soluble mineral insoluble in its process. (More on that below) However, IIS is a low temperature process. Leaching with a liquor follows retorting. The extent to which the liquor removes harmful constituents, moves them to a new waste stream, or causes new post-abandonment problems is largely unknown. There are some hints in the data submitted to BLM for the preparation of the Superior Land Exchange EIS. BLM should assess this information.

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Also unanalyzed is the problem of deep mine methane and other gasses. The problems are well documented by the Bureau of Mines in its experimentation at Horse Draw. This experience should be discussed and mitigating measures should be proposed.

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C-a Is Not C-b Is Not C-11 Is Not C-18
Especially Their Hydrology

In its oral comments, Occidental criticized the EIS relative to its use of the classical Weeks hydrological model for assessing groundwater impacts. Occidental is right in its claims that the Weeks model may not apply to C-a or C-b. However, the hydrology of C-11 and C-18 is not understood as well as the hydrology of the existing leases. It is in fact impossible to extrapolate or interpolate C-a and C-b data to tracts C-11 and C-18. Indeed, according to the EIS (p.72), the transmissivities on C-18 are reversed from other areas in the Piceance Basin. BLM has at its disposal data from C-a, C-b, tract nominations, assessments being performed for the permanent program and Resource Management Plan. It should cite, compare and assess all and their implications for C-11 and C-18. Indeed, it may ultimately be necessary because of uncertainty to choose the classic model or the "worst case."

(135)

Additional Technical Comments

Wildlife

o Given the potential problems with reclamation, the EIS seems to be overoptimistic about postmining vegetative productivity of wildlife habitat. BLM should reevaluate the impacts on wildlife carrying capacity given: (1) toxic uptake by browse, (2) effects on alluvial springs and artesian springs due to mining and dewatering, (3) the legal inability to require augmentation plans to protect aquatic or other habitat, and (4) the problem of growing deep rooted shrubs needed for browse and cover on spent shale, even with adequate topsoiling.

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(138)

Air Quality

o We reference and incorporate the comments of the Environmental Defense Fund with respect to air quality. We wish to stress one additional concern. The industry has severely criticized the model used by BLM for its air quality assessment. We, however, believe that it is crucial to use a complex terrain model to make these assessments. Unfortunately, we are unaware of any industry-sponsored complex terrain model in the public domain. We would be happy to further discuss and comment on which model should be used if industry is willing to make its models available for public scrutiny. Otherwise, we cannot accept the validity of industry criticisms of the model BLM has used.

(59)

Spent Shale

o BLM states that surface disposal will be necessary for surface retorting/underground mining. However, Superior had

proposed the slurry backfill of its mine. Such complete backfill was possible because of reduced volume through recovery of sodium and aluminum minerals. Does BLM challenge Superior's earlier proposal? FOE believes that on the basis of safety, resource recovery, reclamation, and other factors, BLM should in fact require such backfill by stipulation.

o The EIS states that complete high compaction is not practical and eludes to, but does not identify problems resulting therefrom. Please identify the problems.

o Occidental MIS techniques do not, as stated in the EIS, entirely remove the threat of leaching. The only independent assessment of which we are aware is cited by the EIS; yet, Occidental continues to claim there is no leaching. Both the continued high fluoride content of leachates and the poor reliability and temperature control of VMIS result in continued problems.

o The EIS does not contemplate exposure of spent shale due to erosion of topsoil placed on top "in the near future." When is it anticipated and how will BLM respond? We believe erosion and new soil formation as one of the most critical issues extant in oil shale environmental control. (137)

o The public should not fund permanent custodial care. The funds to provide for its possibility (probability!) should be provided in lease payments. (121)

o Stipulations are missing which will address and mitigate all the impacts addressed in BLM's assessment of spent shale reclamation. (121)

Stipulations Missing

o The general environmental stipulations provided in the lease are not adequate to meet all the problems anticipated by the EIS or our comments. BLM should, in addition: (1) require best available technology for all pollution controls, (2) require mitigation to meet the reclamation challenges posed in Chapters 3 and 4, (3) require long term groundwater monitoring, (4) not allow the mining supervisor to end environmental monitoring until at least 30 years after abandonment of any lease. We reference and incorporate the additional comments by the National Wildlife Federation relevant to this point. (138) (18) (121)

Actions Requiring Hearing

o Currently, only the environmental aspects of detailed development plan approval are subject to hearing and comment under the lease. All aspects of DDP approval, including socioeconomic and other aspects should be similarly subject to hearing. Moreover, any changes in the lease or any suspensions should be so subject to hearing. Any other pending decisions should be announced at least in the federal register and be subject to comment. (114)

Energy Alternatives Must Be Reevaluated

In response to several requests to evaluate the energy alternatives to new oil shale leasing, the EIS simply states "The 1973 Prototype EIS examined other energy alternatives to the prototype program. It is believed that this analysis is still valid." We cannot agree. Any analysis completed before 1974 is obsolete. Since this analysis of alternatives determines the need for new leasing (aside from the possible need to test new technologies) -- a requirement of any EIS as required by NRDC v Hughes -- it is crucial to revise the 1973 analysis.

The justification for new leasing presented in the 1973 EIS is the connection between economic growth and energy consumption. Since 1973 this analysis has been thoroughly repudiated both by research and history. DOI estimated that the ratio of energy consumption to gross national product would moderately decline from 93 MBTU per 1958\$ in 1971 to 87 MBTU in 1980 and 79 MBTU at the close of the century. Instead, GNP rose faster than DOI anticipated and energy consumption has remained nearly constant. In 1980, the energy demand/GNP ratio was only 42.3 MBTU/1958\$ -- one-half DOI's estimate for 1980. DOI estimated that 1980 energy consumption would be 96 quads; it was only 76 quads.

Oil price increases have brought about belt tightening but, more importantly, investments in energy efficiency and shifts in energy feedstocks from oil. We have discovered price elasticity. The marketplace has discovered that conservation and efficiency is cheaper than shale oil. We have also discovered that shale oil is not economically capable of meeting demand for liquid fuel; 1985 production will be only 1% of DOI's 1973 projection.

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BLM must revise thoroughly the energy alternatives analysis of 1973 to account for our new knowledge. With respect to the lack of a connection between economic growth and raw energy consumption, we suggest referencing Alternative Energy Demand Futures to 2010 by the National Research Council's Committee on Nuclear and Alternative Energy Systems. For a comparison of costs and a comparison of efficiency and synthetic fuel options, refer to OTA's forthcoming liquid fuels alternatives study (it should be printed soon). Also, we incorporate by reference EDF's comments on this subject.

With costs for gasoline derived from shale oil as high as \$12.30/million BTU (ignoring recent cost overruns -- \$18/MMBTU accounting for the overruns), shale oil will never be able to compete with efficiency improvements which will largely cost less than \$3.50/MMBTU. Refer also to Lovins & Lovins, Brittle Power, for a discussion of comparative costs.

Conclusion

Except for the deficiencies noted here and by our colleagues, BLM has performed the beginnings of a realistic analysis of the proposed action. Additional analysis must be completed and corrections made. Also, we are not enthusiastic about the land use planning which narrowed tract choices to those BLM offered for expressions of interest. BLM should postpone this proposed action until adequate land use planning is complete. In any case, only leasing C-18 is acceptable, and only with the stipulations cited throughout our comments.

Comments prepared by:

Kevin Markey, Colorado Representative
Ellen Hirschberg Geier, FOE Social Impact Specialist
Charles Griffith, Research Associate

9-21-82



ENVIRONMENTAL DEFENSE FUND

COMMENTS BY THE
ENVIRONMENTAL DEFENSE FUND
ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
FOR THE PROTOTYPE OIL SHALE
LEASING PROGRAM

prepared by

Richard Hughes,
Air Quality Modeler

and

Robert E. Yuhnke,
Regional Counsel

September 3, 1982



1. Introduction.

The Supplemental EIS for the Prototype Oil Shale Leasing Program ("SEIS") has numerous deficiencies in its scope, the identification and analysis of alternatives, and the adequacy of its analysis of various impacts. Review by EDF has focused primarily on the treatment of alternatives and the analysis of the impact of air pollutants on the human environment. In both areas, we find the SEIS has major deficiencies. These are discussed below.

2. Identification and Analysis of Alternatives

The alternatives identified for analysis in the SEIS are extremely limited and do not encompass the scope of alternatives contemplated by NEPA. The deficiencies in the alternatives analysis are of two kinds: 1) the failure to consider alternate fuel sources as a substitute for oil shale development, and 2) the failure to consider the air quality impacts of alternate siting and technology options for projects not yet permitted or under construction, including the proposed C-11 and C-18 lease sites. The CEQ's NEPA regulations clearly outline the scope of the alternatives analysis. Together, 40 CFR §§ 1502.14-.16 outline both the types of comparisons to be made and the types of alternatives to be considered. 40 CFR § 1502.14 requires that "agencies shall (a) rigorously explore and objectively evaluate all reasonable alternatives...." The alternatives and comparisons to be analyzed as identified in 40 CFR § 1502.16 include, among others,

- (d) the environmental effects of alternatives....,
- (e) energy requirements and conservation potential of various alternatives and mitigation measures....,
- (f) natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures; and
- (h) means to mitigate adverse environmental impacts....

Taken together, EDF contends that significant alternatives are available and should be evaluated to compare the impacts of each alternative on 1) the environment, 2) energy resources consumed to produce the energy product and 3) the need for development of the resource given available conservation options. These alternatives will be addressed as "national policy alternatives," and "regional development alternatives."

A. National Policy Alternatives.

The Secretary of Interior has statutory control over the leasing and development of all federal energy resources. His responsibilities include the rate and geographic scope of leasing, on-shore and off-shore oil and gas leasing oil shale and tar sands leasing. Each of these energy resources is subject to a separate statutory and regulatory scheme. But each will have significant impacts on the human environment, and each will contribute to the nation's total supply of liquid, gas and solid fuels. Given the Secretary's control over the development of each of these resources, he is in a unique position to evaluate and compare the respective environmental impacts of each form of energy development, as well as the energy costs and other economic impacts which will be associated with each form of energy development.

Oil shale development will contribute mostly to the nation's supply of liquid fuels. The need for any additional oil shale development should be considered within the scope of the "no action" alternative. The current price of liquid fuels is largely the result of reduced worldwide demand. Reduced demand in the U.S. is, in part, a result of significant conservation in both the space-heating and

transportation demand sectors. Reduced demand has resulted in lower imports. The reduced price has strongly influenced industry decisions to invest in synfuels projects, particularly oil shale.

The directive in the CEQ regulations that conservation be treated as a reasonable alternative to the development of natural, depletable resources should be taken seriously by the Secretary. Conservation should be evaluated as an alternative to additional oil shale development. At a minimum, the nation's need for liquid fuels should be evaluated in light of the effects of 1) current law requiring substantial improvements in vehicle fuel efficiency by 1985, 2) reasonable programs for retrofitting residential and commercial structures with insulation and other energy-saving conservation measures, and 3) adopting energy efficiency performance standards for new residential and commercial construction. It makes no sense to invest in mammoth energy products which will have predictable adverse impacts on human health from air pollution, cause "acid rain" and associated impacts on land, water and wildlife resources, impair visibility and otherwise degrade pristine environments in order to make heat that escapes out the window. If conservation alternatives can reduce or eliminate the need for further oil shale development, they will be the most effective mitigation measures, and must be considered as reasonable alternatives under NEPA. The fact that conservation alternatives may not be within the jurisdiction of the Secretary is irrelevant. The CEQ regulations make clear that the alternatives analysis must "include reasonable alternatives not within the jurisdiction of the lead agency." 40 CFR 1500.14(c).

A starting point for an adequate conservation analysis should be the opportunities for reducing consumption of liquid fuels in the private transportation sector. Energy policy justifications for government support and expansion of oil shale development have been: to plug the capital drain from the United States; to reduce threats to national security; and to improve regional economic conditions.¹ Rather than investing resource dollars into oil shale development, these national security and energy efficiency improvement benefits may be more economically achievable by investing a fraction of the same capital into the U.S. automotive industry. Improving the efficiency of the U.S. vehicle fleet will meet energy policy objectives at a lower cost than oil shale development, while maintaining, if not raising the quality of the natural environment and the economic health of the auto industry.

Recent research shows that vast quantities of oil are available from automobile manufacturers in Detroit. In an article published in Scientific American "The Fuel Economy of Light Vehicles" by Gray and Von Hippel² the authors describe the technical feasibility of producing energy efficient automobiles which take into account demographic changes as well as evaluating improved automobile design by use of available best technologies and reasonably anticipated new technologies.³ they suggest that a 60 mpg vehicle fleet, by 1995, is possible without major technological advances.⁴ By the year 2000, fuel consumption would be two-thirds that of 1980 or approximately two million (m) barrels/day (bbl/d).⁵ These fuel savings would be roughly more than twice the energy content of the Trans Alaska Pipeline.⁶

The economics of improved automotive efficiency are quite favorable when compared to investment in oil shale development. A 1980 Congressional Budget Office (CBO) study estimates that the incremental investment necessary to improve fleet/fuel economies to 40 mpg ranges from \$10-\$27.5 billion (b) (\$1980).⁸ Savings resulting from a 40 mpg fleet, when compared to the 23 mpg standard, are .5mbbl/day in 1990, 1mbbl/day in 1995, and close to 2mbbl/day in the year 2000.

By comparison, the U.S. Office of Technology Assessment (OTA) estimates that the cost of a 1mbbl/day oil shale production facility could easily reach \$456 (\$1979).¹⁰ Output is syncrude, which would then require additional energy and capital for conversion to useable liquid fuels.

The comparison of investment alternatives is: a maximum investment of \$27.5 b (\$1980) to save 1mbbl/d in 1995 of liquid fuels versus \$45b (\$1979) to produce 1mbbl/d of syncrude.¹¹

The policy goals of improved energy efficiency, reduced military tensions, improving regional economic conditions, and avoiding further degradation to the natural environment can be more economically achieved by revitalizing the U.S. automobile industry through judicious investment in efficiency improvements. These goals may or may not be achieved by public investment or pursuant to Congressional extensions of the fuel efficiency standards. But in either case, continued technological advances are likely to continue achieving reductions in consumption thereby keeping the price of liquid fuels in line with current real costs. At current prices, oil shale is not profitable. See CBO report. Absent evidence that the demand for liquid fuels cannot be met by other supplies, or that oil shale can become profitable in the near term, the Secretary should not risk the drastic environmental consequences that can result from increased oil shale development beyond that level currently planned by the industry.

Equally important is an evaluation of oil and gas drilling, including secondary and tertiary production techniques, and coal liquifaction as alternatives to oil shale development. Recent discoveries and new recovery technologies suggest that oil and gas development offers a much larger potential source of fuel in the near term than was considered likely only a few years ago. The rush to increased oil shale development may not be justified in the light of these discoveries. Oil shale projects already in the stages of advanced planning may be more than enough to meet current demand if traditional oil production rates can be sustained while conservation reduced demand. The air, water, soil and wildlife impacts of oil drilling and tertiary production techniques are substantially less than the impacts oil shale development will have on those resources. To the extent that oil reserves can meet more of the demand than anticipated a few years ago, the Secretary should consider whether oil shale development, and its attendant adverse impacts on the human environment, can and should be proportionally reduced. (8)

With respect to coal liquifaction it is much less clear how the respective environmental impacts of coal and oil shale will trade off. But given the minimal need for solid waste disposal in coal-based

conversion technologies are compared with the massive volumes of spent shale which will be produced by even a modest level of oil shale development, it is quite possible that a careful analysis will show that, on-balance, coal conversion will have a significantly smaller impact on soil and water resources although air quality impacts may be similar. In comparing coal liquifaction with oil shale, it is also important to consider the wide-range of siting options available to coal projects, whereas oil shale can be economically developed in only a few confined regions of the country. Thus the analysis should evaluate the opportunity to reduce the environmental impacts of coal-based conversion by siting policies which separate the projects from sensitive environmental areas (such as parks, wilderness, non-attainment areas, geological formations sensitive to acid deposition and domestic or agricultural water supplies) and avoid over-concentration of pollution sources.

Finally, an analysis comparing various fuel supply and conservation alternatives should include an evaluation of the rates of CO₂ production associated with each. The evidence is rapidly growing to support the conclusion that CO₂ accumulation in the earth's atmosphere will have a dramatic, if not catastrophic, impact on the human environment. The scientific debate has generally shifted in recent years from whether there will be a "greenhouse effect," to how wide-spread that effect will be. Included in the likely effects will be reduced precipitation, reduced agricultural production and increased food shortages for a growing world population. Given the probability of such large-scale impacts within 50 years or less, it is critical that modern industrial society begin the search for either substitutes to current carbon-fuel combustion energy sources, or carbon-based fuels that reduce the rate of CO₂ growth in the atmosphere. With this serious environmental problem in mind, alternate sources of fuel should be compared with respect to the amount of CO₂ formed by each process per unit of available energy produced. In addition, the economic and technical feasibility of the hydrogen fuel cycle should be considered as an alternate source of energy. (8) (59)

B. Site and Technology Alternatives.

One of the most important variables affecting the air quality impacts of sources in Western Colorado is the location of emission points in relation to major topographic features which influence low-level air movements. Siting a major source in a valley hundreds, or in some cases thousands, of feet below surrounding high terrain will cause emissions from the source to be trapped and concentrated during local inversions. Inversions in the deep valleys of the West Slope occur frequently, especially in winter, and can continue for days. Emissions under the inversion layer can build up to dangerous levels during inversion episodes creating a significant risk of exceeding national health standards.

Conversely, siting sources near ridge tops will guarantee good ventilation under most circumstances. But good ventilation will also increase the likelihood of coherent plumes being transported relative long distances under persistent wind conditions. Plume transport from sources at higher elevations will significantly increase the likelihood of more frequent high concentrations affecting sensitive Class I areas.

The BLM has some important options at this stage of the process that can mitigate some of the most serious adverse impacts attributable to emissions of air pollutants. First, BLM can select alternate lease tracts which can influence the siting of major emitting facilities within the Piceance Basin. Second, BLM can impose lease conditions which impose siting restrictions, such as the elevation of the major emission points in relation to surrounding terrain. Because of the important differences in air quality impacts which can arise from facility siting decisions, the significant siting options available to BLM at this stage of the leasing process should be evaluated to determine their air quality consequences. If NEPA means anything, it requires that real options available to the decision-maker which can be expected to have significantly different environmental consequences should be identified and compared. That analysis has not been done here. (125)

Terrain features and elevations within the federal oil shale region include significant variations. Within that range of variation, modeling should be performed which evaluates valley trapping and inversion frequencies and durations in the area, and the impacts those phenomena will have on emissions from sources sited at different elevations. Similarly, rawinsonde and lower met data collected by oil shale developers in the region should be evaluated to determine whether higher elevation sites will produce significant increases in concentrations in the Class I area. From these comparisons, rational judgments can then be made regarding tract selection and lease conditions affecting stack heights. (1)

Two other major variables affecting air quality impacts are process technology and control technology. Different processes produce markedly different rates of emissions for equivalent product. This difference seems to be especially notable with respect to HC emissions.

Similarly, different control technology options will achieve more or less emission reduction depending on the systems selected. The emission inventory used for the air quality analysis is not explained and therefore the reader cannot tell what assumptions were made regarding either the processes that will be used on the proto-type tracts, or the control systems to be installed.

The modeling analysis for air quality impacts should attempt to evaluate the air quality differences that would result from increasing or decreasing emission rates within the range offered by reasonably available choices regarding processes and control technologies. This would require a clear statement of the processes under consideration, and an assessment of available control technologies. If the analysis shows that air quality impacts are sensitive to the variation in emission rates that would result from consideration of these factors, then the decisionmaker should be informed of those differences and offered a choice of options as part of his consideration of alternatives and mitigating measures.

3. The Air Quality Analysis.

The Air Quality analysis performed to analyze the impacts of new oil shale leasing on air quality or air quality related values is deficient in a number of respects. These deficiencies include both assumptions in the modeling performed for the analysis, and a failure to consider impacts that are likely to affect the human environment. The most important of these deficiencies are discussed below.

3.1 The winds model simulates only the lowest layer of the atmosphere.

It is incapable of handling inversion trapping or valley drainage and accumulation. Air Quality Impact Assessment for the Supplemental Environmental Impact statement for the Prototype Oil Shale Leasing Program, hereinafter referred to as AQIA, 34. This incapacity is dismissed as important to regional scale impacts (ACIA 54). However, there are cases in which these phenomena can be important to regional scale impacts. The severity of regional impacts is strongly related to the effective initial concentration of pollutants. If pollutants accumulate for a period of time before transport, the effective initial concentration will be larger than if direct transport takes place, so that both local and downrange impacts will be increased during accumulation episodes.

Certain impacts are related to chemical conversion. This is especially true for visibility and acid deposition impacts. Accumulation of precursors prior to transport makes the effective travel time longer and allows more time for conversion resulting in greater impacts. This increase can be of even larger dimension if there is accumulation from different sources, leading to possible synergistic source interactions. Wilson, William E. et al., 1977: Sulfates in the Atmosphere, Research Triangle Park, North Carolina, U.S.E.P.A. publication number EPA-600/7-77-021.

A full and fair discussion of impacts as required in 40 CFR 1502.1 must include modeling which explicitly treats such exacerbating phenomena as inversion trapping and valley drainage accumulation. (80)

3.2 Visibility analysis was not done at a sufficiently detailed level.

Visibility impacts were analyzed at the EPA level 1 state. This analysis showed that there is a potential for plume visibility at Flattops Wilderness Area if the MAIS process is used at the 50,000 bpd level. The normal procedure (Workbook for Estimating Visibility Impairment, EPA-450/4-80-031) would involve a level 2 or 3 analysis, usually including a numerical model of visibility impacts. This analysis was not done because the required "level of information" was said to be "beyond the scope of the Prototype analysis". AQIA 118. However, "[a]ir quality impacts, particularly as they affect Class I areas and wilderness areas" was identified as a "significant issue" of the Prototype EIS. Draft Supplemental EIS for the Prototype Oil Shale Leasing Program, hereinafter referred to as Prototype DEIS, p.17. The Flattops Wilderness Area is just such a Class I area. It is inevitable that some uncertainty in estimates of impacts from sources not yet constructed must be tolerated. But there must at least be enough information to be "useful in...maintaining..." the quality of the

environment. The impacts of SO_2 , NO_x and TSP were explicitly modeled in the Prototype DEIS. There is no indication that the "level of information" required for a similar analysis of visibility impacts is any different than the emission terms used for the analysis of the criteria pollutants. If the assumptions made regarding source terms are adequate for making an air quality analysis, those same assumptions should be suitable for a visibility analysis. Indeed, explicit visibility modeling was done on a largely overlapping region, with uncertainties seemingly no greater in the Draft EIS for the Uintah Basin Synfuels Development (hereinafter referred to as the Uintah DEIS).

Any visibility analysis should include an evaluation of the impact of emissions on regional haze as well as plume blight. In most cases, plumes will disperse so that at the distances involved here plumes will not be apparent. But the contributions to regional haze could cause perceptible changes in visibility.

The National Park Service found this to be true in its analysis of the visibility impacts of emissions from multiple sources on Theodore Roosevelt National Park. See Notice of Intent to Issue Certifications, 47 Fed. Reg., 3022 (July 12, 1982) and associated technical analysis. In the Theodore Roosevelt case, the NPS found that each proposed source would pass the Level I Visibility Analysis, but collectively the sources would cause increases in fine particulate concentrations sufficient to cause perceptible reductions in standard visual range.

Using modeled concentrations of both primary particulates and secondary particulates (sulfate) from the proposed sources, NPS calculated reductions in standard visual range within the Class I boundary using the Koschmieder correlation between fine particulates and visual range. The same technique is appropriate here for estimating the impact of major source emissions on visibility in Class I areas.

Visibility impacts should be evaluated because they are one of the most likely impacts of new source emissions on Class I areas. The fact that EPA's visibility regulations focus on plume blight is no reason for excluding regional haze impacts. The Clean Air Act visibility protections do not distinguish between plume and regional haze impacts. Both should be addressed in the EIS. A full and fair discussion of significant impacts must include a complete discussion of visibility impacts.

3.3 Ozone concentration was not modeled.

Although ozone is recognized as a "pollutant of concern, since ambient concentrations are high," AQIA 44-45, ozone analysis was not independently done in the statement. Instead, reliance was placed on results of another draft EIS (the Uintah DEIS) which concluded that a 10^6 bpd oil shale production level would produce only 60% of the ozone standard concentration. Simple reliance on another, as yet unaccepted draft EIS does not provide insurance of scientific integrity of the type required by 40 CFR 1502.24. The methods and data must be critically reviewed to determine if the results are sufficiently reliable to justify entirely foregoing an analysis specific

to this EIS. This review is particularly important in this case, because there are several questions about the methods used in the Uintah DEIS. The upper model layer concentration of O_3 and NO_x are not specified in the Uintah DEIS, so the amount of entrainment is uncertain. The conclusion that there will be compliance with NAAQS's is based on the assumption that high ozone background values are unrealistic. The model predicted that there may be exceedances if the background values are higher than those assumed to represent background concentrations. Such higher background values are acknowledged to exist in the technical report for the Prototype EIS (AQIA 44-45)

Indeed some measured ozone value are in exceedance of the NAAQS primary standard. (Prototype DEIS Table III-2). These large values are dismissed as being the result of transport or stratospheric entrainment (AQIA, p.18). However, no analysis of the published values for ozone was made to determine whether such values represent actual air quality in the area or what the causes of such concentrations might be. (142)

Data obtained by EDF from the files of the BLM show that sites other than the site reported in the DEIS are also reporting similarly high concentrations of ozone. (See Table I). It is impossible to determine how representative those high values are without an evaluation of the data base than that presented in Table III-2. There are more ozone data available for the region than set forth in Table III-2. (See Exhibit 1).

Such high values of ozone as have been observed must be included as representative of the background concentration for the worst case scenarios unless an analysis using accepted scientific methods and procedures demonstrates that these values do not represent actual air quality in the region. The Uintah Basin DEIS is deficient in that it does not give consideration to the measured ozone concentrations in the region. For this reason, the Prototype EIS cannot rely on the Uintah Basin EIS's analysis for ozone.

Assuming that measured ozone levels in the region represent actual air quality, the impact of new sources should be considered in light of those concentrations. The degree to which new source emissions will affect the frequency of high ozone levels above 200 ug and above the NAAQS should be evaluated. Such an evaluation requires both an air quality modeling analysis of the ozone which will result from NO_x and HC emissions from the new sources, and also an analysis of the frequency distribution of measured background concentrations. The analysis of background measurements should include an effort to determine whether high ozone concentrations can be correlated with measured groundlevel concentration of NO_x and HC, with expected seasonal periods of high ozone concentrations, or with transport into the area from distant sources. Some have suggested that the peak levels of ozone are associated with stratospheric intrusions. This theory should be tested by comparing the hours of peak measurements with the passage of storm fronts that might cause intrusions, determining whether the peak hours occur during periods when high levels would be expected if the ozone were formed in the lower atmosphere, and an analysis of the six hours on either side of the peak hours to determine whether the concentrations

Table 1

Maximum Measured O_3 V at Various Sites
in the Oil Shale Region (ug/m³)

	1974	1975	1976	1977	1978	1979	1980	1981
Cb Oil Shale Site		151 ¹ , 5, 6	124 ¹ , 6	164 ¹ , 6	160 ¹ , 6	246 ¹ , 6	154 ¹ , 6	155 ¹⁰
Ca Oil Shale Site		(178) 2, 5	(178) 2, 5		176 ²	160 ²		
Anvil Points Oil Shale Site							206 ³	265 ³
Chevron Clear Creek Site							94 ⁴	152 ⁴
White River Oil Shale Project	(190) ⁵	(190) ⁵	220 ⁷	(160) ⁹	(160) ⁹	(160) ⁹	(160) ⁹	(160) ⁹
Mack Power Plant								150 ¹¹
Union Oil Shale Project								136 ¹²
Paraho (UT) Site A-6		150/150	140/140	160/160	137/137	151/149	143/143	
		parenthesis indicate multi-year		maximum				

(Reproduced in Exhibit 2)

- Sources:
1. Cb Annual Report, Vol 2, April 1981
 2. Rio Blanco Monitoring Report #7, No. 1980
 3. Anvil Points 1981 Interim Data Report, No. 1981
 4. Chevron Clear Creek Annual Report, 1980-81
 5. A Preliminary Assessment of the Environmental Impacts From Oil Shale Developments. EPA-600/7-77-069.
 6. Cathedral Bluffs PSD Application
 7. White River Detailed Development Plan, Vol. 1

(Available at EPA Region Office)

8. TOSCO PSD Permit Application
9. White River Shale Project PSD Application
10. Ca Quarterly Report #7
11. Colorado-Ute Mack Site Meteorology and Air Quality Monitoring Program
12. Union Oil Quarterly Report

are normally distributed for the twelve hour period or whether the peak values are isolated events appearing as outliers for the day.

These analyses are important because if the high values in excess of the NAAQS are representative of regional air quality, then the area must be considered a non-attainment area. Accordingly, any new sources of HC would require offsets from existing sources contribution to ozone formation in the area. If ozone is formed by emissions from local sources, the likelihood of obtaining offsets and the costs should be considered in the EIS. If the ozone is transported into the area from distant anthropogenic sources, offsets may be hard to identify. If the ozone originates from natural sources, than offsets may be unavailable and any planning for sources that will add to local concentrations of ozone should not proceed.

Failure to 1) consider available data showing background levels of ozone, 2) scientifically evaluate the contributions of planned or permitted HC sources to ozone formation in the study region, 3) evaluate the contributions of new sources on the proposed prototype least tracts to ozone concentrations in the study region, and 4) address how exceedances of the national health standard will be prevented is inconsistent with NEPA. A final EIS which fails to evaluate and consider these factors will certainly be inadequate for the purpose of sustaining a final decision by the Secretary to lease new oil shale tracts. (141)

3.4 Total acid deposition and the probable impact of acids on sensitive areas of the affected region were not addressed.

There was no attempt to quantify the amount of acid wet deposition. "Acid rain" was identified as a "specific concern" in the Prototype DEIS, p.17. Acid deposition is of particular concern in the intermountain West because of the extreme sensitivity (because of low buffering capacity) of many of the mountain lakes and streams, Lewis, Wm. M. 1982: Limno. Oceanogr. 27, 167-172. A full and fair discussion of significant impacts must include a quantitative assessment of both wet and dry acid deposition. As discussed in 2.1 above, this analysis of acid depositions must include consideration of the effects of inversion trapping, valley drainage and other phenomena that can cause pollutant accumulation or prolonged travel time. Because receptors vary widely in their sensitivity to acid depositions, of impacts can only be identified if both the quantity and severity of the deposition are correlated without a more specific and reliable analysis of acid deposition impacts, the public and the decision maker can not make a reasoned decision among the alternatives without knowing what the impacts of projected emissions of acid-forming pollutants will be. (7)

Two extreme methods can be used to estimate the amount of total acid sulfur deposition occurring in a region. These methods bracket from above and below the true value of sulfur deposition. We can use airborne SO_2 and sulfate concentrations to calculate the total dry deposition. Alternatively, we can add to this quantity an upper limit to the wet deposition, calculated by assuming that all aerosol and SO_2 which passes through an average rainstorm is deposited.

Dry deposition may be estimated from the expression:

$$F_D = [N(SO_2)V(SO_2) + N(SO_4)V(SO_4)]T$$

Where F_D is the total dry deposition per unit area, T is the length of the year, $N(SO_2)$ and $N(SO_4)$ are the ground level annual average airborne SO_2 and sulfate concentrations (in terms of weight of sulfur per unit volume), respectively and $V(SO_2)$ and $V(SO_4)$ are the deposition velocities of SO_2 and sulfate, respectively. Values of $V(SO_2)$ and $V(SO_4)$ for terrain in the west central U.S. have been compiled by Sheih et.al. (Atmospheric Environment 13, 1361, 1979). These values are time-averaged. In reality V will vary diurnally and seasonally. But for the purpose of estimating annual deposition, a single well-chosen value of V for each component will suffice. An upper limit on wet deposition may be calculated by assuming that the entire local mixing layer is cleared of sulfur during a local precipitation event of average size. Thus where F_W is the total wet deposition of sulfur

$$F_W = [N(SO_2) + N(SO_4)] \times H \times N$$

per unit area, H is the mean mixing height and N is the number of rainstorms per year with size greater than some cutoff. Of course, since sulfur is fed into the local air parcel during rainstorms, this method may under-estimate wet deposition.

Experience in the eastern U.S. and in Europe suggests that F_W is about equal to F_D . So as a crude approximation, in the absence of western U.S. data, F_D may be doubled to get total sulfur deposition. In order to perform these calculations, background SO_2 and sulfate concentrations and incremental increases must be available. If only $N(SO_2)$ is available, a lower limit on total sulfur deposition may be calculated from

$$2 N(SO_2)V(SO_2).$$

Extensive studies have been performed on sensitive aquatic ecosystems in order to determine a level of sulfur deposition which is "safe", that is, which is not accompanied by acidification of surface waters. Based on studies in Europe and eastern North America values greater than $0.5 \text{ gmS/m}^2\text{-yr}$ are accompanied by acidification of surface waters over a period of one to three decades while lower values may lead to acidification over a longer time scale or may not lead to any significant acidification. Thus, values above 0.5 may be regarded as unsafe, whereas values below 0.5 may or may not be regarded as "safe", but are much less likely to cause significant adverse impacts in the near-term.

Report of the 1982 Stockholm Conference on Acidification of the Environment, Stockholm, June 28-30, Swedish Ministry of Agriculture;
U.S. Canada Memorandum of Intent on Transboundary Air Pollution,
Report of the Working Group on Impact Assessment, February 1981.

In order to apply the current methodology for assessing impacts, one needs to determine the sensitivity of Colorado water resources to acidification compared to that of eastern and European aquatic systems. Such evaluations are generally based on the alkalinity available from rock and soil types underlying the water resources. If the sensitivities are comparable to those found in low buffered areas of the Northeast such as the Adirondacks, then a value of 0.5 gm/m²-yr may be compared with the results of equations (1)-(3) to determine if damaging levels of acid sulfur deposition are approached. Comparisons of the sensitivity of receptor areas should be feasible based on comparing the measured alkalinity of water bodies with those in the Northeast, or by comparing bed rock types. Alkalinity is reported for some Flat Tops lakes by Turk, John T., and Dee B. Adams, "Sensitivity to Acidification of Lakes in the Flat Tops Wilderness Area, Colorado," U.S. Geological Survey (1982). The values reported by Turk should provide a basis for estimating the effects of deposition rates calculated as proposed above.

3.5 Impacts of emissions of carbon monoxide were not analyzed.

While an encyclopedic discussion of all conceivable impacts is not required in an EIS, regulation require that for impacts only briefly discussed, there be "enough discussion to show why more study is not warranted." 40 CFR 1502.2. "Statements... shall be supported by evidence that the agency has made the necessary environmental analysis." 40 CFR 1502.1.

Some mention is made of the "background" concentration of CO, but there is no discussion of the impacts expected under the various alternatives. This omission is particularly in violation of the requirements for a showing of no significance because:

1) The PEDCO study (1982), relied on in the Prototype DEIS for estimates of "background" concentration, projects that CO emissions with oil shale development in Rio Blanco, Moffat and Garfield counties will increase well above the 100 ton per year significance criterion established for PSD application. There must at least be a demonstration that developing of proposed C-11 and C-18 tracts will not result in the threshold CO emission increases which will trigger PSD review as projected for other oil shale projects. If this demonstration cannot be made, then there should be a full analysis of the air quality impacts of CO emissions from both baseline sources and the prototype lease sites.

2) Reported CO concentrations (Table III-2) show a several-year trend of increase, approaching the NAAQS's. The states 1981 CO data are available. These data indicate this toward the NAAQS in the Grand Junction area is continuing. These data should be evaluated to determine the significance of increased CO emissions caused by development of C-11 and C-18. This analysis should include both direct emissions from the oil shale projects, and "secondary emissions" (See definition 40 CFR § 52.21) attributable to VMT growth associated with both the baseline oil shale development and development of the prototype sites.

3.6 The impact of hazardous pollutants were not analyzed.

There is no discussion of the impacts of hazardous pollutants such as heavy metal or radioactive compounds. If these are not significant issues, the prototype DEIS must contain enough discussion to (1) assure the reader that a sufficient analysis if its significance has been done and (2) explain the basis on which a determination of non-significance is based.

4. The analysis fails to reliably identify and model worst case scenarios.

Probably the single most serious deficiency of the Air Quality analysis is the failure to evaluate the impact of emissions on important impact areas. For example, no analysis is made of the impact of oil shale sources and secondary emissions on the TSP non-attainment area in Grand Junction. This is one area where public health is most clearly at issue, yet it is given no consideration whatsoever. If oil shale emissions will exacerbate the health hazards from TSP concentrations, the public and the decision maker should be informed. Ignoring these impacts constitutes a gross violation of the letter and spirit of NEPA.

An adequate analysis of TSP impacts within the non-attainment area must also include a discussion of the opportunities for, and costs and benefits of obtaining offsets. The identification of available offsets would be a legal requirement for sources that will contribute to the non-attainment concentrations. Offsets must be identified before the Secretary could determine that new projects on the prototype sites could lawfully proceed if emissions from those sites will contribute to the now attainment area.

Other important impact areas not considered are Colorado Category I areas (8 25-7-209, C.R.S.), Arches National Park in Utah and geologically sensitive areas (i.e., low buffering capacity) outside of the Flat Tops Wilderness.

Evaluation of impacts on these receptor areas require modeling of many wind directions in addition to the three directions selected for the analysis. In addition, an adequate analysis of total sulfate and SO_2 deposition in the region requires an annual modeling run to predict cumulative concentrations from which total deposition can be estimated.

More specific deficiencies with the analysis reported in the draft EIS are set out below.

4.1 The assumed "influencing" winds may not represent a worst case scenario for the Flat Tops Class I area.

The surface wind field is diagnosed from a single "influencing" wind, which is assumed to be at 4 m sec^{-1} and steady in direction for 24 hours. Five candidate wind directions are proposed and three are chosen for analysis by a "screening" process. Because the wind field

over complex terrain can be quite sensitive to large scale influences, it is important to screen a sufficiently large number of candidates so that the worst case can reasonably be expected to have been "caught." The candidate wind directions were chosen to represent straight line trajectories from sources to sensitive receptors. Because the wind field is perturbed by topography, the trajectory will not be straight line. Thus the trajectories might miss the receptor which is "aimed at." An example of this can be seen in the NW wind case. See especially figure 3-22 to 3-27 and figure G-67 of the AQIA. The plume from the Craig power plant passes to the east of the Flattops Wilderness area and stagnates. The wind trajectories for the NW and W winds (figures G-8 and G-9 in the AQIA) indicate that under the influence of a NNW wind, the Craig power plant plume might mass, and possibly stagnate directly over the Flattops Wilderness area. It cannot be known if NW winds represent a worst case with respect to plumes from the proposed projects unless other plausible worst case scenarios are modeled. The requirement for a worst case analysis means that a sufficient number of wind directions must be modeled to assure that a worst case is actually simulated.

The assumption of steady winds precludes the simulation of certain worst case scenarios. A worst case wind scenario should allow for the possibility that the plume may meander in such a way as to pass over several sources. A comparison of figures G-38 and G-65 indicates that if the wind direction shifted from WSW to NW after 20 minutes of simulation, the trajectory would likely have included plumes from the Rio Blanco, Cathedral Bluffs and Superior projects. A worst case analysis must include such wind direction shifts as will induce the largest reasonably foreseeable plume interactions.

4.2 The worst case scenarios are not pollutant-specific.

The meteorological situations conducive to worst case impacts are different for different pollutants. For species with high deposition velocities, such as certain TSP, long range transport is not an important factor, but for gaseous pollutants it will be. Similarly, unreactive pollutants are not extremely sensitive to changes in travel time but pollutants such as ozone and sulfates are.

As discussed in 4.1, the worst case scenario for reactive pollutants should include such meteorological situations as inversion-trapping, valley drainage, and convoluted trajectories. Even these scenarios should be tailored to fit the worst-case characteristics of the pollutants with respect to insulation, humidity, plume intractions, etc. For example, for SO_2 conversion rates and thus visibility impacts may be maximized under moderate dispersion, because of increased entrainment of O_3 (PLUVUE user's guide) while, all other things equal, O_3 impacts may be maximized under condition of minimal dispersion. In this EIS, acid dry deposition is estimated from the west-wind scenario which was assumed to be worst case for SO_2 , TSP and NO_x . There is no reason to believe that it will also be worst-case for either acid dry or wet deposition. It is clear that with longer travel time caused by a convoluted trajectory or episodes of stagnation, sulfate formation will be greater prior to deposition on sensitive terrain downwind, and therefore acid deposition will be increased.

4.3 Emission inventories may not be consistent with a worst-case analysis.

Emission inventories were obtained from the Bureau of Land Management EIS office. No further information is given concerning the nature of this inventory. To be consistent with a worst case analysis, this inventory should reflect the full capacity of the facilities. Region Workshop on Air Quality Modeling, April 1978, EPA O.A.Q.P.S. The requirement for a worst case analysis and insurance of scientific integrity means that the basis of the emission inventory must be stated and that this basis should be full capacity production.

The inventory used in this analysis is generally lower for both total emissions, and emissions from individual project sites, as compared with the inventory used in the Uintah Basin analysis. An example of this discrepancy is shown in Table 2.

Table 2. Comparison of Uintah DEIS and Prototype DEIS

	Estimates of TSP Emissions (kg/m)			
	2000-2003		1990-1993	
	Uintah	Prototype	Unitah	Prototype
Colo. Oil Shale Emissions	1,503	1,174	818	511
Other Colo. Emissions	22,314	852	20,877	745
Total Colo. Emissions	23,817	2,026	21,695	1,256

These figures represent total emission for the region of Colorado modeled (the Uintah DEIS includes certain Utah sources as well).

The discrepancy for "other" sources is understandable, since the Prototype DEIS did not include in its modeling such area sources as off-site road dust, railroads, etc. However the large differences in projections for oil shale emissions (and similar differences for SO₂ and NO_x emission) are not discussed. The requirement for insurance of scientific integrity, 40 C.F.R. 1502.24, means that there must be an explanation for the differences between oil shale emissions projected by the Prototype DEIS (derived from the BLM EIS office) and those projected by the Uintah DEIS (based on "applicant-supplied data").

4.4 The assumed surface temperature precludes simulation of certain worst case phenomena.

Surface temperature for the WINDS model was held constant in time at 20°C at 1800 m elevation, and changed by 6.5°C for each km of elevation change. Holding temperature constant through the simulation period precludes any modeling of diurnally varying thermal winds, such as slope winds. Assuming that temperatures vary only with height precludes any modeling of winds induced by differential

heating on north and south facing slopes. These unmodeled effects are likely to increase pollutant concentrations in low elevation areas by contributing to valley drainage/accumulation, (see 2.1) meandering of trajectories (and thus increase of travel time) and deflection of trajectories over different sources. (see 3.1) For example, under the influence of an inversion, sulfur compounds might accumulate in the Piceance Creek and White River Basins during the night where conversion to SO_2 can take place. With sufficient daytime heating, up slope flow could entrain the polluted air mass up the valley walls into the "free" atmosphere, possibly affecting the Flattops area. This type of scenario was identified as a worst case situation in S.A.I. report No. 81274, pp 12-15. The surface temperature assumptions made in the prototype DEIS preclude modeling of these types of scenarios.

The validation studies of WINDS indicated that the "temperature field must be represented in complete detail for the model to provide realistic and verifiable results." AQIA C-16. To comply with the requirement for a full and fair discussion of impacts the temperature field should be set to vary in space and time and in a manner consistent with observations in the oil shale region. Failure to use detailed temperature fields is inconsistent with the proper use of the model, and casts into serious doubt the validity of any conclusions drawn from the model.

4.5 Mixing depth assumptions may not represent the worst case.

A spatially uniform mixing depth was assumed for the dispersion model CITPUFF. As a worst case assumption, an average daily minimum mixing depth was calculated at 800 m. However, this depth was applied at the maximum elevation of the model, viz. the 3500 m elevation at Flattops, so that the mixing depth was set at 4300 m ASL for the entire modeling domain. This means that the mixing depth over much of the modeled area ranged to above 2,000 m. Over the southwest portion of the model, it was as much as 3,000 m, more than 1,000 m above the average daytime minimum mixing height (AQIA 60). Such deep mixing heights over much of the modeling region allows plume dispersion which is not representative of either worst case, or even typical, situations. This is because CITPUFF plumes are allowed to disperse to the height of the mixing layer before being "reflected." An unrealistically high mixing layer allows an excessive amount of dispersion to take place, thus lowering ground level concentrations. This feature of the model is particularly objectionable when modeling is done to predict impacts on important low elevation features, such as the TSP contributions to the Grand Junction non-attainment area, and the SO_2 contributions to the Category I areas at Dinosaur National Monument and Colorado National Monument. To perform worst case analysis, CITPUFF must be modified to accept a terrain-following mixing height or, if this is impossible, another model more suitable to the region must be used.

5. Application of the WINDS model does not comply with recommended procedures.

The grid spacing necessary for resolution of local winds in the WINDS model is related to topographic variation. It is stated that 1 km grid spacing is appropriate if terrain variation is 1,500 m over a 10,000 km² area, and that grid spacing should be reduced by 1 km for every 300 m increase in terrain variation (AQIA C-16). Since 0.5 km grid spacing is the minimum the model will treat properly, this would seem to imply that the model is not valid for terrain variations of more than 1,800 m. It is not clear how this scheme should be modified when applied to the present modeling region of over 50,000 km². The terrain variation over the modeled region is approximately 2,300 m. Moreover, the grid spacing used was 2.86 x 3.7 km. This is clearly outside the model application guidelines set forth on AQIA C-16 for a 10,000 km² region. To comply with the requirement for insurance of scientific integrity, there should be a sensitivity study over a 50,000 km² domain with at least 2,300 m variation, to determine if the grid spacing used provides sufficient resolution of local winds to realistically simulate plume trajectories. (147)

6. There is insufficient assurance of scientific integrity.

- 6.1 Verification for WINDS and CITPUFF does not provide an assurance of scientific integrity.

WINDS was verified by runs over San Diego County and the Oregon Cascades. The latter verification procedure is more representative of the type of complex terrain found in the oil shale region. However, these verification runs were done only for daytime conditions. Thus, thermal winds such as slope winds and sea breezes, which typically reverse directions during evening hours, were not verified. Slope winds are of great importance in the oil shale region. The validation data reported in Appendix C of the AQIA may give an unrealistically favorable picture of the ability of the WIND model to simulate a 24 hour period, as was attempted in the prototype study. (148)

The only validation of CITPUFF mentioned is a comparison to predictions of other models. This provides the reader with no information on CITPUFF's ability to simulate reality. To comply with the requirement for insurance of scientific integrity there must be a comparison of the model with observations collected during conditions similar to the conditions which were modeled.

- 6.2 Predictions of impacts are inconsistent with predictions made in the Uintah DEIS

As noted above (3.3) the emissions used in prediction of impacts for the Prototype DEIS were significantly smaller than those used in the Uintah DEIS. Never-the-less the impacts predicted by the Prototype DEIS are significantly larger. For example, TSP concentrations near Rifle, Colorado were predicted by the Prototype DEIS to be 704 ug/m³. The comparable Uintah DEIS prediction (near Parachute) was 80 ug/m³. The Prototype EIS predicted NO_x near Rifle (247)

of 4,100 ug/m³. The Uintah DEIS (derived, as suggested, by multiplying SO₂ concentrations by NO_x/SO₂ emission ratios) is asserted to be less than 100 ug/m³. While no two modeling efforts can be expected to produce identical results, some of these discrepancies are over an order of magnitude. The assurance of scientific integrity requires that there be an explanation for the differences so that the public and the decision maker can have a reliable basis for choosing among alternatives. Otherwise, the decisions suggested by the two DEIS' may be contradictory.

7. Conclusions stated in the text are inconsistent with data shown in tables and in plots of concentrations.

The EIS states that the only exceedance resulting from C-11 and C-18 emissions (which would not occur under the no action alternative) is a projected SO₂ concentration of 9.4 ug/m³ (of which 5.0 ug/m³ is attributable to the lease sites alone) east of the Flattops area, assuming an "influencing" wind from the west. This does not comport with the data presented in the AQIA.

A comparison of figure 3-22 with 3-25 and 3-23 with 3-26 shows that under a NW wind, the isopleths delineating the shape of the region of exceedance for TSP and SO₂ near Rifle, Colorado all different for the "no-action", "all sources" scenarios. So, while the prototype may not cause the appearance of a new region of exceedance, it will change the location and extent of the region of exceedance.

The modeling methodology allowed for calculation only of 24-/m concentrations. The simulation of NO_x exceedances, which has an annual average standard, thus is lacking. Though the probability of exceedance is large, given the size of some of the 24-/m concentration predictions, the reader is unable to form a clear idea of where and to what degree the NO_x standard will be exceeded and what the contribution of the C-11 and C-18 sites will be. A full and fair discussion of the impacts of NO_x emissions must include explicit modeling of annual average NO_x concentration.

8. BLM's proposal to promote additional air pollution by leasing the prototype tracts is unlawful. } (1)

The Bureau of Land Management (BLM's) Organic Act, Federal Land Policy and Management Act (FLPMA), 43 U.S.C. § 1701 et. seq., sets forth the responsibilities of the BLM in the management of the public lands. FLPMA provides that the management planning and development of public lands be carried out in compliance with applicable federal and state pollution control laws. 43 U.S.C. §§ 1712(c)(8), 1732(a)(b), 1733(g).

FLPMA requires the Secretary of Interior (Secretary) to provide for compliance with pollution control laws, including state and Federal air....pollution standards or implementation plans," in the development of land use plans. 43 U.S.C. § 1712(c)(8). Section 1732(a) governing the management, use, occupancy and development of public lands requires the Secretary to "manage the public lands.... in accordance with the land use plans developed by him under section 1712." 43 U.S.C. § 1732(a). Subsection (b) of section 1732 states that the Secretary shall "regulate, through...leases...the use, occupancy, and development of the public lands," in a manner consistent with FLPMA and "other applicable law." 43 U.S.C. § 1732(b). (emphasis added) This subsection, therefore, requires the Secretary to enforce air pollution laws through lease "terms and conditions."

Finally, section 1733, in setting forth the Secretary's responsibilities regarding enforcement of management, use, and protection requirements, states that:

The use, occupancy, or development of any portion of the public lands contrary to any regulation of the Secretary or other responsible authority,...is unlawful and prohibited." 43 U.S.C. § 1733(g).

The regulations of the Administrator of the EPA and state air pollution control agencies promulgated pursuant to the CAA constitute regulations of "responsible authority [ies]" which constrain the use and development of public lands.

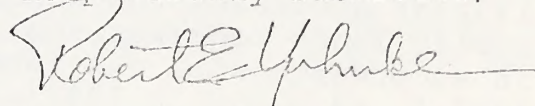
These provisions of FLPMA indicate that BLM must conduct its planning and management processes in compliance with Federal and state pollution laws and regulations. In requiring the BLM to manage public lands in compliance with federal and state air pollution standards, Congress clearly intended BLM to issue leases only when the available data indicates that such leases could be developed for their contemplated uses without causing or aggravating violations of federal and state air quality standards.

BLM's Prototype Leasing DEIS indicates that emissions of air pollutants for all existing and proposed pollution sources within the study region will cause exceedances of the national ambient air quality standards (NAAQS's) for SO₂, NO₂, and TSP. The increment analysis for the proposed oil shale lease tracts indicates that these projects will cause incremental increases over the predicted concentration for each of these pollutants. By issuing the leases BLM would, therefore, be allowing exceedances of NAAQS's to be exacerbated. BLM will be in violation of FLPMA if it issues leases for the prototype tracts when its own EIS data indicates that such development

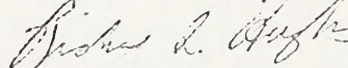
will aggravate exceedances of NAAQS's.

Accordingly, EDF contends that it will be unlawful for the Secretary to approve new leases for additional oil shale development unless he can firmly establish that other sources included in the baseline analysis will not be built, and that the prototype tracts can be developed without contributing to violations of the Colorado SIP or any NAAQS, or any PSD increment. The DEIS record prepared to date does not support such a showing.

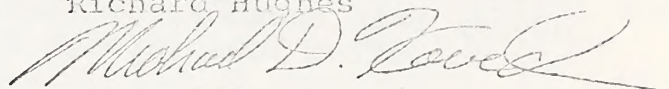
Respectfully submitted,



Robert E. Yunnke



Richard Hughes



Michael Koved

FOOTNOTES

1. OTA, An Assessment of Oil Shale Technologies (Washington, D.C.) p.16.
2. Charles Gray, Jr. and Frank VonHippel "The Fuel Economy of Light Vehicles." Scientific American May 1981, Vol. 244, No. 5, pp 48-59.
3. Design Improvements includes reduction in vehicle weight, reduced aerodynamic drag, and power train redesign. For more detailed description see Solar Energy Research Institute. A New Prosperity: Building A Sustainable Energy Future. (Andover, Mass.: Brick House Publishing) p.300. Also see Scientific American Vol. 244, No. 5, p.51-56.

Demographic changes include matching future car design with anticipated family size, ages, and driving patterns. See Scientific American Vol. 244, No. 5, p.51.

4. Scientific American, May 1981, p.48. It should be noted that investments in these measures are cost-effective. See p.58.
5. Ibid., p.49.
6. According to Gray and VonHippel (Scientific American, May 1981) 15 percent of U.S. oil production is from Alaska. In 1980, the roughly 1.5mbbl/d from Alaska has a BTU content of 8.7 EJ/day [Assumes 5.8E6 BTU/bbl (Energy Data Card, Energy and Resources Group, Univ. of CA, Berkeley, 1981) and 42 gallons per barrel. Gasoline is assumed to have a BTU content of 125,000 BTU/gal. (Energy Data Card) or 5.3E6BTU/bbl. If energy savings are 2mbbl/d, then fuel savings are 1.83 greater than the energy content of TAPS.]
7. SERI. 1981 p.304. Congressional Budget Office. Fuel Economy Standards for New Passenger Cars After 1985. (CBO: DC Dec. 1980).
8. Scientific American May 1981 p.59.
9. Ibid., p.57.
10. OTA. 1980 p.218.
11. A synthetic crude produced by adding hydrogen to crude shale oil. (OTA 1980 p.3)



Department of Energy
Washington, D.C. 20585

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Mr. George C. Francis
State Director
Colorado State Office
Bureau of Land Management
1037 20th Street
Denver, CO 80202

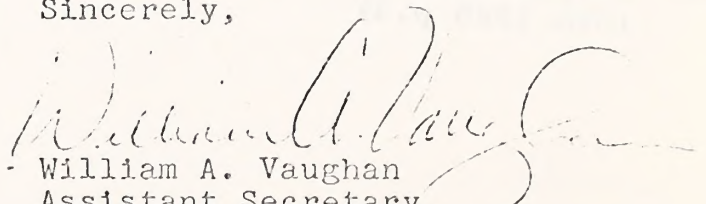
Dear Mr. Francis:

The Draft Supplemental Environmental Impact Statement (EIS) for the Prototype Oil Shale Leasing Program, prepared by the Bureau of Land Management (BLM), has been reviewed by various offices of the Department of Energy (DOE). In particular, the Laramie Energy Technology Center, DOE's lead center for oil shale research and development, the Office of Fossil Energy, and the Office of Environmental Protection, Safety, and Emergency Preparedness, which includes the Office of Naval Petroleum and Oil Shale Reserves, have reviewed the Draft Supplemental EIS. Our consolidated comments are provided in the enclosure.

As you know, dramatic changes affecting the oil shale industry have occurred in recent months, which are not reflected in the draft EIS. We are also concerned about the apparent lack of consistency between various reported air quality analyses. Since the information presented in the BLM EIS impacts DOE programmatic oil shale objectives, we request that these comments be carefully considered in the preparation of the final EIS.

We appreciate your willingness to extend the comment period on this EIS due to the late arrival of review copies at DOE Headquarters. We would welcome the opportunity to discuss our comments with you in further detail, if desired. In this regard, you may wish to contact Dr. Robert J. Stern, Director, Office of Environmental Compliance (FTS: 252-4600). We hope you will find our comments helpful.

Sincerely,


William A. Vaughan
Assistant Secretary
Environmental Protection, Safety,
and Emergency Preparedness

Enclosure

cc: Oil Shale Projects Team Leader, BLM

Department of Energy Comments - Draft Supplemental EIS for the
Prototype Oil Shale Leasing Program

Characterization of Existing Environment

Dramatic changes affecting the oil shale industry occurred less than 5 weeks after the public scoping meetings with the announced closing of the Colony Oil Shale Project and subsequent decisions by Rio Blanco, Chevron, and other companies to slow down their oil shale development. The Colony decision, especially, altered the socioeconomic conditions in western Colorado, significantly changing the baseline BLM presents in the draft EIS for Rifle and Meeker, Colorado. Instead of boomtown growth, the western slope of Colorado is now facing high rates of unemployment: Garfield County - 12.8%, Rio Blanco County - 7.1%, and Mesa County - 9.6% (June 1982 data). Rather than examining these changes, BLM has presented a description of the existing physical and social environment and environmental consequences which no longer has a basis in fact. We urge BLM to reflect these changes in the final EIS.

(4)

Air Quality Impacts

The discussion of air quality impacts references scenarios and emission factors used for BLM's Uintah Basin Synfuels EIS, but arrives at different conclusions. This is especially confusing due to the near simultaneous release of both documents. These differences should be rectified by careful examination of the model and data inputs by both BLM offices involved, so that compatible analyses are presented. Furthermore, we urge BLM to select a standard model for future work on the upcoming Oil Shale Programmatic EIS.

(14)

(2)

(2)

The air quality impacts presented in the draft EIS differ significantly from results of a separate study performed for BLM by Systems Applications, Inc. of San Rafael, California, for the Uintah Basin Synfuels EIS. (Air/Water Pollution Report, August 16, 1982, p. 322.) This study predicts limited air quality impacts from proposed synthetic fuel projects in the Uintah and Piceance Creek Basin of Utah and Colorado. The report concludes that only 2 of 17 projects under consideration are likely to violate the stringent ambient air quality standards near the Flat Tops Wilderness Area.

Improved meteorological and emission factor data, and improved models, are needed to better predict air quality impacts of shale development. The EIS should reflect the limitation of

(32)

(79)

(140)

the present models and the extent to which they may represent a "worst case" analysis.

Due to the nature of this draft EIS and the Uintah Basin Synfuels EIS, the projected air quality impacts could affect the development of future oil shale facilities in Colorado, Wyoming, and Utah. Special care should be paid by BLM to the accuracy of the predicted impacts. We invite BLM to consult with the DOE and the Environmental Protection Agency (EPA) on the model used to predict the air quality impacts in order to present the most technically defensible results.

Multi-Mineral Development

The development of multi-mineral lease tracts C-11 and C-18 presents socioeconomic and environmental impacts which BLM discusses solely as oil shale related. This discussion should also include the impacts associated with the production of dawsonite and nahcolite. BLM does not address whether production of these minerals will likely be simultaneous with shale oil or sequential. The production scenario and its socioeconomic and environmental effects might be staged in a manner which could modify peak impacts and serve as an effective mitigation measure. It could also present an alternative to be considered in a future Detailed Development Plan, if the tracts are leased.

(148)

Spent Shale Disposal

The discussion of spent shale disposal should be moved from Chapter III to Chapter IV, since shale piles are not present in the existing environment but will be an environmental consequence.

(6)

The DOE's Laramie Energy Technology Center (LETC) has been involved in intensive research on spent shale disposal and leachates. Recent studies have shown the cementation of shales to be a carbonaceous reaction which appears to lack long-term stability. Engineering studies on pile stability, compaction, and other engineering properties of spent shale have been conducted on the largest spent shale pile in the United States at Anvil Points, Colorado. Further relevant information can be obtained from James Westhoff (DOE/LETC, 307-721-2274).

(2)

LETC has also been involved in large scale leachate studies in conjunction with the American Society for Testing Materials.

The studies have investigated the applicability of hazardous waste regulations to spent shale and development of standardized leaching tests for a large variety of shales. Further information and results are available from Larry Jackson (DOE/LETC, 307-721-2255).

Other Comments

- o An alternative use of excess mine waters is the creation of wetlands habitat. Studies using oil shale wastewater to create wetlands have been underway for the U.S. Fish and Wildlife Service (FWS) and have focused specifically on excess mine water (Synfuels Week, August 9, 1982, p.3).
- o To facilitate better public understanding, we suggest that BLM use the term "modified in situ" instead of "mine assisted in-situ". This would be consistent with the practice of DOE, EPA, U.S. Geological Survey, Minerals Management Service, Colorado Mined Land Reclamation Division and other Federal, State, and local agencies. (149)
- o The directional orientation of Figure III-II should be included on the diagram to assist persons not familiar with the geology of the Piceance Creek Basin. Additionally, since Yellow Creek is discussed throughout the draft EIS and is presented as recharging from the aquifers as shown in Figure III-II, it should appear on this figure. (150)



UNIVERSITY OF COLORADO AT BOULDER

Boulder, Colorado 80309

Campus Box 483

Growth Impact Group

INSTITUTE OF BEHAVIORAL SCIENCE

September 20, 1982

George C. Francis, State Director
and
John Singlaub, Team Leader
Bureau of Land Management
White River Resource Area
P.O. Box 928
Meeker, Colorado 81641

Dear George Francis and John Singlaub:

Thank you for your reference to the 1981-82 segment of the Growth Impact Group study, on page 88 of the DEIS for the Prototype Oil Shale Leasing Program. We are pleased that the study has been of such immediate use.

However, we must point out your error in citing our work. The citation given on page 253, under "Boulding, Elise, et al.", is totally incorrect. The correct citation for our report should be:

Lillydahl, et al. 1982. Quality of Life, Expectations of Change, and Planning for the Future in an Energy Production Community. Boulder, CO: University of Colorado.

The first author of the report is Jane H. Lillydahl, NOT Elise Boulding. The Growth Impact Group is affiliated with the Institute of Behavioral Science at the University of Colorado at Boulder. No member of the Growth Impact Group has ever been affiliated with Denver University.

We hope you will correct your records accordingly.

Sincerely,

Elizabeth W. Moen
Project Director,
Institute of Behavioral Science
Associate Professor, Sociology

EWM:ig

J. PHYLLIS FOX CONSULTING SERVICES

1988 California Street, Berkeley, CA 94703
(415) 845-0983

September 20, 1982

John Singlaub, Team Leader
Bureau of Land Management
White River Resource Area
P. O. Box 928
Meeker, CO 81641

Dear Mr. Singlaub:

I have reviewed the Draft Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program, and my specific comments are listed on Attachment A to this letter. These focus on the water-related aspects of this EIS due to the short time available for review. The references cited in my review comments are listed in Vols. 2-5 of the BLM report, "Literature and Data Search of Water Resource Information of the Colorado, Utah, and Wyoming Oil Shale Basins."

I do not believe that this document adequately fulfills its stated purpose. It contains many technical errors, is based on numerous improper assumptions, contains inconsistencies among alternatives and analytical methodologies, it is poorly referenced, and the information it is based on is quite outdated. Many specific examples of these shortcomings are presented in my comments in Appendix A.

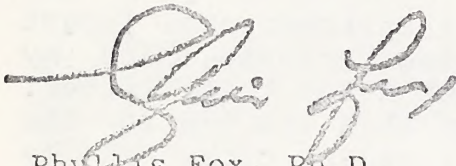
The Summary on p. 3 and the Issues and Concerns on p. 17 clearly state that one of the purposes of this document was to update the 1973 Prototype EIS. This is not achieved, and the majority of the information in this EIS is no more current than that presented in 1973. The authors of this report are not familiar with oil shale in general and oil shale environmental research in particular, as is evidenced by the reference list. Many excellent and current reviews of most topics pertinent to this EIS have been prepared in the past five years. Most of these have not been referenced in this document. Many hundreds of research reports have been published in the past 10 years on leaching, revegetation, effluent composition, wastewater treatment, hydrology, etc. Less than 5% of these are acknowledged in this report. Many that are referenced are poor

choices and do not reflect current scientific consensus (i.e., Crawford et al., 1977).

This is undoubtedly due to the very short time that was allotted to the preparation of this EIS and to its unfortunate timing with respect to several BLM contracts that were to supply the requisite information (i.e., Literature and Data Search of Water Resource Information of the Colorado, Utah, and Wyoming Oil Shale Basins, etc.).

This report needs to be extensively modified to correct technical errors and expanded to reflect the current state of knowledge. In particular, the literature searches on water resources, wildlife, etc. that were completed during 1982 should be incorporated into this document. Because of the massive revisions required, this EIS should be resubmitted for public review prior to additional leasing under the Prototype Program.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Phyllis Fox', with a stylized flourish extending from the end.

Phyllis Fox, Ph.D.
President

Appendix A

Comments on Draft Supplemental Environmental Impact Statement
for the Prototype Oil Shale Leasing Program

by

J. P. Fox

CHAPTER II

1. The description of the No Action Alternative on p. 24 does not state what technology is assumed (i.e., in-situ or surface retorting) for tracts C-a and C-b. I also was unable to find any statement of assumed technology for these two sites in other sections and chapters of the EIS. It is essential for the reader to know what technology is assumed so that subsequent assumptions and analyses can be evaluated. (151)

2. The estimated water requirement of 8,000 ac-ft/yr from the White River per 50,000 bbl/day production (for tracts C-a, C-b and proposed leases) requires justification. Much of the water demand will be met by treated mine water and process water, considerably reducing White River diversion requirements. This is clearly stated in the BLM EIS on the Proposed Superior Oil Company Land Exchange, in Detailed Development Plans for tracts C-a and C-b, in various assessment reports (i.e. Fox, 1980; Nevens et al., 1979), and it has been recently evaluated by the U.S.G.S. (Alley, 1982). The justification for the use of 8,000 ac-ft/yr should be clearly discussed. (152)

CHAPTER III

1. The reference, Fox (1980), first appearing on p. 72, is missing from the reference list. It is incorrectly listed under Berkeley (1980) in the references. (6)

2. The second sentence in the second complete paragraph on p. 72 is attributed to Fox (1980). Although well yields are discussed in that report, the yield values in this sentence are not from that report. The correct reference should be used or the numbers revised to correspond to those cited by Fox (1980). (2)

3. The last sentence of the section on Groundwater Quantity on p. 72 states that the report, Piceance Basin Spring Hydraulics Investigation, was prepared for the Colorado State Engineer by the U. S. Geological Survey. The reverse is true. The report was prepared by the Colorado State Engineer for the USGS. (6)

4. The section on Groundwater Quality on p. 72-73 should be expanded to include more recent data, and specific numerical

values or ranges which are cited in the text should be referenced. The majority, if not all of this section, is taken from Weeks et al. (1974). This should be stated in the first paragraph on p. 72. The extensive monitoring programs at tracts C-a and C-b have greatly expanded the available groundwater quality data for the Piceance Basin. This new information should be reviewed and interpreted, particularly as it relates to trace elements. (Note that this new data was summarized in Fox, 1980.)

5. The last sentence in the section on Groundwater Quality states that "The boron and lithium levels are high enough to be toxic to most plants". This is true only for boron. Most plants can tolerate Li concentrations up to 5 mg/l, and the Li concentrations reported by Weeks et al. (1974) range from 0.01 to 6.5 mg/l; only one out of the 10 reported values exceeded 5 mg/l.

6. The sentence fragment, "with approximately 80 percent of the surface runoff in the basin being supplied by groundwater (Robson 1981" on p. 75, second column, first complete paragraph, should read "with approximately 80 percent of the streamflow in the basin being supplied by groundwater (Weeks et al., 1974)." (6)

7. No references are given for the data in Table III-9, p. 73.

8. Table III-9, the relevant text in Chapter III, and surface water analyses in Chapter IV focus on the station, White River near Ouray, Utah. This station is very far downstream from the area of interest, and it would be more relevant to this EIS if a closer station were selected. Reasonable choices include the White River near the Utah-Colorado State Line or the White River near Watson, UT. The reason for this emphasis on a geographically remote station should be presented in the text on p. 75. 3)

9. The section, Surface Reclamation and Solid Waste Disposal, p. 98-105, only discusses surface spent shale. No discussion is provided of in-situ spent shale. The disposal technology, geotechnical considerations, and hydrogeochemistry are very different, and both surface and in-situ spent shale should be discussed. (Note that the 1973 EIS also omitted in-situ spent shale.) Since the stated purpose of this supplement to the Prototype Program is to extend it to other technologies, specifically, true in-situ processing (p. 14 this EIS), it is important that in-situ solid waste disposal be discussed. (154)

10. The majority of the discussion in the section, Surface Reclamation and Solid Waste Disposal, is outdated, technically incorrect, and reflects a lack of understanding of the issues and concerns involved. This section needs to be extensively revised and expanded. Some of the more problematic areas are discussed in subsequent comments.

11. The section, Expansion of Spent Shale, p. 101, states that the volume of spent shale increases about 20%, compared to raw shale. This is correct but the explanation of why this is so is 5)

incorrect and should be deleted or corrected.

12. The section, Compaction of Spent Shales, p. 101, contains technical errors, improper word usages, and misinterpretations of the principal reference (Bloomsfield and Wells, 1980). It also is limited in its coverage of the literature, relying on a single overview report on USBM research. The entire section should be rewritten to correct technical errors and updated to reflect current knowledge. Some specifics are:

- The second sentence in the first paragraph should read: "Spent shale compacted to 90 to 100 pounds per cubic foot would result in good strength ...". The last sentence in this paragraph, "Compaction to this level....on a large scale" is incorrect and should be deleted. The reference (Bloomsfield and Stewart, 1981) clearly demonstrated that compaction to this level was readily achievable using standard compaction equipment (see p. 21).

(156)

(157)

- The first sentence of the second paragraph is meaningless and should be deleted.

- In the third paragraph, the term "compaction strenght" is used. The correct term is "compressive strength".

(2)

- The reference, Bloomsfield and Stewart (1981), only discusses Paraho and TOSCO spent shale. Each spent shale is unique, and generalizations are not appropriate. This section generalizes the results from Paraho or TOSCO to all spent shales, without proper qualifications.

13. The section, Leachates of Shale Disposal Piles, p. 103, is based exclusively on a brief report by Bloomsfield and Stewart (1981) and on an article by Stollenwerk and Runnells (1981). These are not "overview" reports, and this discussion does not reflect present state-of-knowledge of spent shale leaching. Over 100 research reports that address this topic have been published since the 1973 EIS. These were recently reviewed (A Critical Review of Oil Shale Leachates, Fox 1982). This literature should be evaluated to identify important environmental concerns (i.e., codisposal, volatilization from pile surface, microbial transformation of metals to more toxic compounds, construction impacts), and the section extensively revised to reflect current knowledge.

(158)

14. The section, Underground Shale Disposal, p. 103-104, only discusses the technology of underground disposal and does not address the more important water impacts of this method. Backfilled mines may be leached by groundwater when dewatering is terminated, in a manner similar to the leaching of in-situ retorts. The resulting leachates will be transported in the local aquifers and eventually discharged to surface streams.

(2)

15. The section, Aboveground Shale Disposal, on p. 104 does not reflect the present state-of-knowledge and requires extensive

revision and expansion. This topic has been reviewed recently by Redente et al. (1981) and Redente and Doerr (1982) in the Proceedings of Oil Shale: the Environmental Challenges. These reviews should be used to update and improve this section. The title of this section should be changed to reflect the fact that it deals with revegetation of spent shale piles rather than above ground disposal.

16. The section, Location of Shale Disposal Piles, p. 105, should be expanded to include a discussion of the effects of pile location on local recharge areas and on alluvial aquifers. (111)

17. The section, Monitoring of Shale Disposal Piles, p. 105, implies that consolidation of spent shale minimizes leachate quality. The opposite is true. Increased compaction reduces the void space and, thus, the water-to-solid ratio in the mass of the pile. This increases the concentration of most parameters in the leachate. Compaction also increases the rate of leachate escape from the pile.

CHAPTER IV

1. A special appendix should be prepared which describes the hydrologic analyses summarized on p. 131-141. The EIS does not provide sufficient information to evaluate this material. (2)

2. The discussion of Mine Dewatering on p. 132 variously states that the pumping rate during the first seven years was 2.5 cfs (third paragraph) and 26.5 cfs (fifth paragraph). Page 137, third paragraph under Impacts to Piceance and Yellow Creeks states that the pumping rate during this same period was 37.5 cfs. This should be resolved.

3. The discussion of excess mine water in the last paragraph in the section on Mine Dewatering, p. 132, and the subsequently described Mine Dewatering with Reinjection Wells calculations are inconsistent with the assumption, stated on p. 24, that all of the project water will be withdrawn from the White River. Also, Colorado water law may prohibit the use of tributary groundwater. This legal point should be addressed. (155) (2)

4. The rapid recovery of the dewatered area, noted in the second complete paragraph in the second column on p. 132 and shown in Figure IV-8 is surprising and disagrees with other simulations in the area. This other work (i.e., Mehran et al., 1980; Brown, 1978) has shown that recovery is an extremely slow process due to the large void volume in the retorted region (what assumptions were made regarding recovery of resources in these model runs?) and the very low hydraulic conductivity of the upper aquifer. Mehran et al. (1980) found that the average rise in the phreatic surface was approx. 1.8 ft/yr, compared with about 400 ft/yr in this work. If the model used in the EIS did not consider saturated/unsaturated flow, this could partly explain the difference. The reason for this rapid recovery should be explained, considering the sizeable literature which demonstrates (160)

the contrary.

5. The section, Impacts to Existing Sources, p. 133, and Figure IV-9, present information on regions where drawdowns exceed 10 feet. It is not clear whether these drawdowns are due only to dewatering at the two new leases or to the new leases plus tracts C-a and C-b. Figure IV-9 should also show regions where drawdowns exceed 10 feet for the No Action Alternative.

6. The last sentence in the first paragraph on p. 134 should be modified to read: "The contaminants which are most likely to increase are pH, sulphate, sodium, chloride; certain trace elements including vanadium, molybdenum and lead; and certain organic compounds such as phenols and organic nitrogen..." Carbonate and bicarbonate should decrease in leachates compared to groundwaters due to precipitation reactions. This is discussed in Peterson et al., 1982.

7. The discussion of leachate transport in the last two paragraphs of the section, Leaching of Subsurface Retort Chambers, p. 134, should be revised. This discussion is based on Fox (1979). These estimates were revised to reflect new data from tracts C-a and C-b, and the revised estimates were published in Fox (1980), referenced elsewhere in this EIS.

8. The reference to Table III-10 in the first complete paragraph on p. 137 is incorrect. The correct table is IV-8.

9. The analysis of ground and surface water quantity and quality impacts of the No Action Alternative (see p. 131, 133, 137, 140) is based on the scenario used by Robson and Saulnier (1981). I believe that this scenario differs from the No Action Alternative used in this EIS and described on p. 24. The same model and assumptions should be used to analyze both the No Action Alternative and the Development Alternative. Otherwise, comparisons between the two are not relevant. An additional model run should be performed for the No Action Alternative or differences between the two scenarios should be carefully detailed and their impact discussed.

10. Page 137, second column, first phrase, indicates that water use estimates are based on 4 barrels of water per barrel of oil. This water use rate may be low for recovery of saline minerals due to the large amounts of water required for mineral separation (see BLM EIS on Superior Land Exchange.) A section should be added to this EIS that discusses water use at the proposed lease tracts and which justifies the values selected for evaluation.

11. The discussion of surface water quality impacts of the No Action Alternative and the Development Alternative on p. 140-142 omits impacts due to subsurface leaching of retorts. The leachates from in-situ retorts eventually discharge into Piceance and Yellow Creeks, degrading downstream quality. This has been discussed and quantified by Fox (1980) and more recently, by Persoff and Fox (1982).

12. The discussion of surface water quality impacts of the No Action Alternative on p. 140 only addresses impacts due to dewatering. The same types of impacts discussed for development alternatives, i.e., construction, mining, processing, etc (p. 140-141) also apply to the No Action Alternative and should be included.

13. The Processing Section on p. 140 states that "retort waters are produced by the combustion of hydrogen and oxygen". This is incorrect. They are produced by the combustion and pyrolysis of organics (kerogen, bitumen).

14. The last sentence on p. 140 should be replaced by: "The high value of 22 barrels of water per barrel of oil was due to groundwater inflow at an undewatered site and is not realistic for commercial production. In general, water production rates are higher for in-situ processes than for surface processes due to the use of steam during retorting."

15. The bulleted material in the first paragraph on p. 141 should be expanded to include the item "- initial water content (water is added for dust control and to facilitate compaction)".

16. The phrase "characteristics of " should be deleted from the first sentence in the section, Leachates from Surface Disposal Piles, p. 141. The last sentence in the first paragraph of this section should be modified to read: "Some of the minor components in spent shale leachates can be toxic to plants, animals, and humans and include lead, fluoride, lithium, boron, molybdenum, phenols, and organonitrogen compounds." Arsenic should be deleted from this list because it occurs at low concentrations in leachates.

17. The first complete sentence in the second column on p. 141 should be modified to read: "Permeability factors estimated for the Paraho and TOSCO processes at maximum applied stress (800 psi) vary from 0.26 ft/yr to 0.48 ft/yr.

18. The section, Runoff from Surface Disposal Piles, p. 141, starts with a discussion of runoff from a pile and concludes that percolation may be a controllable problem. The entire discussion, except the first sentence, relates only to percolation. The first sentence should be deleted and the section heading revised to read: "Percolation through Surface Disposal Piles". A section should be added on surface runoff (see Margheim, 1975).

19. The discussion of methods to mitigate the impact of pile leachates on p. 141, second column, second complete paragraph, pertains to in-situ retorts, not surface retorts. These types of controls are not technically nor economically feasible for surface retorts, and they should not be recommended in this EIS. For example, surface retorts operate in the temperature range of 500 to 750 C. The formation of relatively insoluble silicates

only occurs at temperatures of 900 to 1000 C. Achieving these temperatures in existing surface processes would require extensive redesign and adversely affect oil yield, net energy balance, and process economics. High temperatures are readily achieved in in-situ retorts because they are adiabatically contained by raw oil shale underground.

20. The recommendations on process water disposal in the third paragraph under Mitigation on p. 141 are inappropriate. First, water quality control technologies developed by the oil refining industry cannot be readily applied to oil shale process waters. The information referenced in Crawford et al. (1977) is very out of date. The recent literature is full of references to unsuccessful attempts to apply these technologies to oil shale process waters. This has been discussed by Fox et al. (1981). Second, it is inappropriate to recommend final disposition by evaporation or incorporation into retorted shale. Many of these waste waters (i.e., retort water, gas condensates, refinery sour water) have high concentrations of volatile organics which would be released into the air if the waters are evaporated or codisposed. Many of these organics (i.e., nitriles) are highly toxic, carcinogenic, etc. Contaminants in waters added to the shale may be leached from the piles and eventually reach receiving waters by runoff or percolation. This impact would be most severe during pile construction. As a minimum, waters disposed of by evaporation or codisposal must be steam stripped and treated to remove significant quantities of organics and inorganics. Technology has not been demonstrated even at the bench-scale which is capable of achieving this.

September 21, 1982

Garfield County Citizens Association
P.O. Box 604
Glenwood Springs, Co. 81602

Oil Shale Projects Team Leader
BLM, White River Resource Area
P.O. Box 928
Meeker, Co. 81641

Dear Sirs:

The Garfield County Citizens Association (GCCA) would like to take this opportunity to respond to the Draft Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program.

Our first observation is that a move towards additional leasing at this time is very ill-advised for a number of reasons. The oil shale industry in general is presently, and according to most observers will continue to be for a number of years, in a stationary if not declining position. It certainly does not make sense anyway one looks at it to offer additional leases at a time when project after project is shutting down or cutting back. The two existing federal leases in Colorado are prime examples. The shut-down of the Colony project as well as the reluctance of Union Oil to make a definite commitment towards expansion of their facility are further examples.

Upon examination of the companies which have expressed positive interest in additional leasing, we are forced to conclude that none of them have the necessary resources to undertake the massive front-end investments necessary to bring an oil shale project to fruition, or to operate such a facility until the market for shale-oil is restored and absorb the necessary losses until such time. Sure, a lot of companies would like to be able to control large tracts of Federal land. It is made even easier for them due to the present low demand for additional leasing because the bonus bids necessary to gain control of such tracts of land becomes very small. Consequently, less money is available to local governments for impact mitigation, companies which lack the resources to adequately develop the tracts are given control over large portions of Federal land which they hold for largely speculative purposes, and the local economy is subject to another virtually predictable boom-bust cycle which few of us can ill-afford.

As regards the specifics of the DES, we must disagree with the choice of the preferred alternative for the above reasons. Rather, the GCCA supports the No Action Alternative in which no additional federal leases are issued until a proven need for them exists and the companies proposing such leases can document and insure they will be able to bring such a project to fruition. This involves their documenting that their technology has a high probability of success, is economically feasible and that they will continue to operate the project once the feasibility is demonstrated by actual production. Only in this way will local governments and residents have some assurance they will not be subjected to the devastating boom bust cycle once again.

These are the only circumstances in which the GCCA could support additional leasing of oil shale tracts provided other concerns we have relating to social, economic, environmental and health issues are adequately mitigated. In such a case we would prefer that such a lease be a multi-mineral lease. A multi-mineral lease is preferable because production of more than just shale oil would further insure economic feasibility of the project over a period of time, such that even if the market for shale oil declines, production of other minerals could make it economically feasible to continue with the project.

We must also take exception to the Baseline figures which were used to analyze social and economic impacts as they include the now defunct Colony project and the LaSal pipeline project. The DES deals with this by stating on page 18 "...it is not unreasonable to expect these projects or similar ones to come on line in the future." In fact, it is extremely unreasonable to expect these or similar projects to come on line in the future. The inclusion of Colony or a similar project to come on line in the future completely obscures the socio-economic impacts of the proposed leasing of two more prototype leases. Although, by subtracting the Colony project the total impact is lessened, it also makes the impact of leasing two additional lease tracts that much greater. That is to say, impacts that will be experienced will be more directly attributable to leasing Federal lands rather than spread out among a number of other ongoing projects. This makes the Federal decision and the alternative selected in the DES that much more crucial.

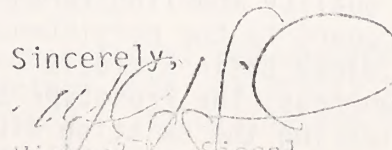
(4)

To reiterate once again, the proposal to lease additional lands for oil shale development at this time, given current and projected demand and markets for oil products in general and shale oil in particular is extremely ill-advised from both a national policy standpoint and a local residents standpoint. The people of Garfield County simply cannot afford another short-lived boom by an under-capitalized speculative shale project with little or no current or projected future demand for its products. Such a short-lived boom will be followed by a devastating bust of the type we have just gone through, the repercussions of which are still being felt by those of us who make Garfield County our home.

The Garfield County Citizens Association supports the No Action alternative and firmly believes the DES is flawed in that its Baseline data is no longer relevant and that absolutely no ability to follow through on actual development and ultimate production has been shown by the companies seeking additional leases.

Thank-you for your consideration of our comments.

Sincerely,


Michael L. Siegel,

Member of the Steering Committee of the
Garfield County Citizens Association

44

Rocky Mountain Oil & Gas Association, Inc.

COMMITTEE ON OIL SHALE

September 20, 1982

Mr. John Singlaub, Team Leader
Bureau of Land Management
White River Resource Area
P. O. Box 928
Meeker, CO 81641

Dear Mr. Singlaub:

The Rocky Mountain Oil and Gas Association (RMOGA), through its Committee on Oil Shale, appreciates the opportunity to comment on the Draft Supplemental Environmental Impact Statement (DEIS) for the Prototype Oil Shale Leasing Program (47 FR 31080, July 16, 1982).

Our comments are limited to our primary concerns with the air quality, hydrology and socioeconomic segments of the DEIS as presented below. These comments identify significant inadequacies in the data and evaluations presented in the DEIS. It is our understanding that the associated EIS for the long-term oil shale leasing program is being prepared at this time and that this Programmatic EIS will use much the same baseline information, assumptions, and evaluation methods as does the Prototype Program EIS. We believe that the general comments provided herein, as well as more detailed comments to be submitted by RMOGA member companies, are applicable to both EIS development activities.

Air Quality

The inadequacies in the air quality evaluation generally use unrealistic modeling approaches. The wind field model, used as the primary input to the air dispersion model, has been validated in a flat terrain (San Diego), but not in the complex terrain of the oil shale region. The model thus produces theoretical input; the data are a projection and are not verified. One result is an unsubstantiated zone of convergence in the Rifle area, leading to unrealistically high concentrations of several air quality constituents.

The air quality modeling further includes overly conservative assumptions with regard to the persistence of stable winds. Other modeling by SAI (DEIS on Uinta Basin Synfuels Development for BLM) uses a "D" stability class, whereas, the Prototype EIS analysis uses an unrealistic "E" class. Considering the existing diurnal variations observed in the Piceance Basin, such stable (Class E) conditions would enhance the existing easterly nocturnal drainage flows, further mitigating impacts on Class I areas such as the Flat Tops. The modeling included in the DEIS does not account for these drainage flows.

(33)

(34)

(144)

(80)

Mr. John Singlaub
 September 20, 1982
 Page Two

The errors and uncertainties inherent in air quality modeling are not adequately addressed in the DEIS analysis. A better perspective for interpretation and decision-making would be provided by presentation of ranges of likely results rather than consideration of singular data point projections.

(32)
 (82)

The DEIS should limit its consideration of increment consumption. The general weakness in modeling capabilities should be noted in the DEIS evaluation. We believe it is important to point out for the benefit of all, impacts on PSD increments are "consumptions" of the increment to some degree. This "consumption" estimate is dealt within the permitting process, as would be any predicted exceedance. The PSD process should not imply "violation" of or even be directly related to public health standards.

(60)

The visibility analysis presented in the DEIS is extremely conservative and should be considered only as a coarse screening procedure. A recent study of visibility models by ERT for the American Petroleum Institute showed that present methods yield predictions which are essentially unrelated to measured values. Using common methods, visibility predictions may differ by a factor of four or more. Thus, the development and validation of suitable and scientifically valid models for prediction of visibility impairment (as well as demonstration of monitoring methods) is needed before such analyses can be used for decision-making purposes. Given this and the poor understanding of visibility impairment mechanisms, this section of the DEIS is inappropriate for decision-making purposes.

(140)

The suspended particulates (TSP), in particular as it relates to fugitive dust, is overly conservative. It should be noted in the DEIS evaluation that violations of TSP presently occur under natural conditions. Additionally, because of particle size considerations, fugitive dust is a policy issue much more than a health issue.

(86)

Projections of acid deposition are presented in the DEIS without adequate substantiation or interpretation. Modeling capabilities for these projections are not well developed. It should be noted that the SAI analysis for the Utah EIS concludes that acid deposition is not a significant impact.

(9)

Socioeconomics

The socioeconomic evaluation is superficial and unsupported in the DEIS with data or analysis. It is unclear what analytical tools commonly used for such analysis have been employed. The evaluation is qualitative and unsubstantiated and may be misleading.

(36)

(130)

Mr. John Singlaub
September 20, 1982
Page Three

The implications and possibilities of negative impacts are discussed. However, no empirical data and no defined methodology is provided to support what are apparently speculative conclusions.

In addition, the DEIS discussion of socioeconomic issues does not account for planned growth or related mitigation measures, and such measures have been developed and implemented. Certain positive benefits and developments such as increased tax base, jobs, etc. are also incompletely addressed or ignored in the DEIS.

(124)

Hydrology


The uncertainties in modeling the complex hydrologic systems in the Piceance Basin need to be addressed in more detail in the DEIS. The models employed are largely unvalidated. Use should be made of the extensive data bases, including that on dewatering operations, which exist to substantiate the projections of these models. As presented above on air quality models, the need exists to deal with modeling uncertainties in a manner to provide a realistic perspective for interpretation and decision making.

(135)

Thus, in the above three areas the Committee on Oil Shale believes that the DEIS modeling efforts need to be reconsidered. When results are presented in the final EIS they should be qualified to acknowledge the use of unvalidated models and preferably ranges should be given to indicate the degree of uncertainty in the predictions.

Again, RMOGA appreciates the opportunity to comment. If questions arise concerning our comments, please contact me.

Sincerely,



Pam Oldham
Director
Committee on Oil Shale

BS;pss



United States Department of the Interior

MINERALS MANAGEMENT SERVICE
RESTON, VA. 22091

In Reply Refer To:
MMS-Mail Stop 650

16 SEP 1982

Memorandum

To: John Singlaub, Team Leader, Bureau of Land Management
White River Resource Area
Meeker, Colorado

From: Acting Associate Director, Onshore Minerals Operations

Subject: Review of Draft Supplemental Environmental Impact Statement for the
Prototype Oil Shale Leasing Program

The Minerals Management Service (MMS) has reviewed the subject environmental impact statement (EIS) both in the field and headquarters. Our comments follow.

General Comments

The supplemental EIS for additional prototype oil shale leasing represents a sincere and thorough effort to compile a wealth of information into an information decision support document. The Bureau of Land Management (BLM) is to be commended for the thought and effort that have gone into compilation, modeling, and evaluation necessary to prepare this document. Their effort to seek out and use information gained by various agencies over the past three-quarters of a decade of oil shale development should also be noted. However, a number of conclusions and observations presented in the supplemental EIS cannot be substantiated based on experience gained from the prototype program to date. This is particularly evident in the discussion of air quality, hydrology, reclamation, and resource recovery. This office would encourage BLM to have their technical representatives for these aspects meet with the staff of our Oil Shale Office in Grand Junction to carefully review related portions of the EIS prior to compiling the final document.

During editing of the final EIS, BLM is strongly urged to delete reference to the Colony Project, which has now been indefinitely suspended, and to the Multi Mineral Corporation's sodium mine, which is no longer an identifiable project now that the operating agreement with Industrial Resources, Inc. (the sodium lessee), has been terminated. BLM should also be urged to indicate which models were used to make predictions about air quality and hydrologic impacts, and to identify the source of the data bases used in model runs. The results of these modeling runs will impact future resource leasing in the basin far beyond the two tracts of concern in this document. The fact that the lessee-required detailed development plan in reality is the National Environmental Policy Act (NEPA) process extended into actual site planning needs to be more

fully explained only in the document. Finally, a number of conclusions are stated in very positive language (will and would), when actual experience with management of the prototype program indicated there is, in fact, a great deal of latitude in perceived impacts more befitting statements couched in "may" or "could."

Specific Comments

Page i, paragraph 2, line 6. We suggest stating that these tracts will be leased specifically and only for multiproduct production (oil shale and sodium minerals). (27)

Page i, paragraph 2, line 10. The statement that leasing C-16 would have "marginally" fewer impacts may detract from the true decisionmaking value of this document by "loading" the conclusion. (62)

Page 3, column 1, paragraph 3, lines 19-20. In order to provide the Government and the lessee with the greatest postlease latitude to use new and innovative methods that maximize resource recovery while minimizing or controlling impacts, stress that development scenarios other than the generalized ones presented in this EIS might also be applicable to these tracts. (19)

Page 3, column 1, paragraph 4. Any of the generalized methodologies could also be used to recover shale oil and gas from the upper portion of the Mahogany Zone. True in-situ methods might also be used to produce oil and gas from the naturally associated Leached Zone, as was being evaluated by Equity Oil Company in the Piceance Basin under Department contract. (19)

Page 3, column 2, paragraph 3, lines 7-8. It can be argued that any further leasing of oil shale tracts would be premature until after BLM has completed the White River Resource Area Resource Management Plan (RMP). This approach, however, would only delay obtaining actual development and environmental management experience under the stringent terms and safeguards of the prototype program essential to administration of any full-scale production oriented permanent leasing program.

Page 4, column 1, paragraph 4, lines 12-16. It is misleading to compare an actual standard to a predicted 24-hour average, as it will falsely magnify the excess (in this case, some 41 times). (83)

Page 4, column 2, paragraph 4, table. Round all dawsonite values to the same number of significant figures right of the decimal point. (6)

Page 4, column 2, paragraph 4, line 8. Intuitively, it would be more accurate to state that "better than 20 percent of the total oil shale resource beneath these tracts could be recovered. This approaches the first pass efficiency of production from many conventional oil and gas fields. Improvements in existing technologies that can come only from actual experience, as well as development of new methods, could" (162)

Page 6, figures S-2, S-3, and S-4. Actual work force and population figures coming out of the White River and Union oil shale projects suggest that direct labor requirements can be readily reduced by as much as one-third over estimates made public to date. Due to the required 1 to 2 years of predevelopment lease-required environmental baseline data acquisition, population buildup will not follow the depicted straight line path, but will be concave curves both toward and away from the peak construction point. It is also unrealistic to assume, if both tracts are leased, that their respective work force requirements will peak at the same time. There will also be a great deal of "shared" labor between tracts, further reducing actual population buildup. It is also highly questionable whether regional population for the "no action" scenario would peak in 1988 contemporaneous with the preceived maximum labor point should tracts C-11 or C-18 actually be leased. In fact, the "hard" form of these tables suggests a level of predictive knowledge that may not be supportable. (2)

Page 9, column 1, paragraph 1. The reclamation assumptions made in this paragraph are not supportable. Natural gulches used for processed shale disposal will probably be filled to or above the existing ridge line, significantly diminishing the influence of the existing natural drainage slope and aspect. Experience on the existing prototype oil shale tracts suggests that predictions of availability of "soil-like" material based on apparent slope and aspect can be very misleading, with generally more "soil-like" material being found than anticipated. (163)

Page 9, column 1, paragraph 5, lines 7-10. The assumption that development of sodium minerals would proceed independently on C-11 as opposed to simultaneously on C-18 because of the existing sodium lease on the latter, flies in the face of sound mining engineering and resource recovery as broadly described in the three generalized development scenarios. It is reasonable to assume that the successful bidder on C-18 will acquire, in some manner, an operating agreement with the sodium lessee to coproduce both resources. (155)

Page 9, column 1, paragraph 6, lines 1-4. The position that "significant" air quality deterioration will occur under the "no action" alternative is unsupportable, because there is no guarantee that development of private oil shale holdings in the southern part of the basin will proceed with any more certainty or diligence than the existing prototype tracts. Furthermore, the entire paragraph is written in a manner which may easily be misinterpreted. (25)

Page 9, column 2, paragraph 1, lines 1-2. Meteorological evaluation on the existing prototype oil shale tracts in Colorado indicates strong diurnal/topographic air drainage patterns. Thus, C-11 would tend to drain to Ryan Gulch, while C-18 could back into both Ryan Gulch and Yellow Creek. Thus, it can be argued that the severity of air quality impacts related to either tract should not be significantly different. (164)

Page 9, column 2, paragraph 2, lines 3-4. The assumption that mine dewatering on C-11/C-18 will have the worst possible hydrologic impact cannot be substantiated. It is apparently based on the assumption that vertical groundwater communication was well developed along various structural features. Hydrologic testing on tracts C-a and C-b indicates this not to be the case. The system is (88)

highly complex, consisting of numerous "wedding cake" layers of varying vertical and horizontal transmissivity. Rich oil shale intervals, such as the Four Senator's Zone and the Mahogany Zone, tend to form competent aquitards that may virtually isolate mine dewatering effects from the upper zone aquifers that support most of the base flow in Piceance and Yellow Creeks. Both the Golder Report and U.S. Geological Survey Professional Paper 908 are dated and based on assumptions that are not fully supported by more recent field data.

Page 9, column 2, paragraph 3, line 9. "Hydrogen carbonate" should be "bicarbonate."

Page 9, column 2, paragraph 4, line 8. The Mahogany Zone is not totally "impermeable."

Page 9, column 2, paragraph 5, lines 3-4. How was the value of 4 percent flow reduction derived?

Page 9, column 2, paragraph 5, lines 8-9. Piceance Creek already experiences periods of "no flow" due to agricultural diversion with no oil shale industry to speak of, making demands on or significantly dewatering the ground water system.

Page 9, column 2, paragraph 5, line 12. The perceived problem of "no surface flow" could also be realistically mitigated by controlled release of water back into the creek from surface reservoirs or pumping projects on the White River. It is felt that the modeling results summarized in this paragraph are overly pessimistic.

Page 10, column 1, paragraph 3, line 6. What is meant by "subtracting their incremental contribution"?

Page 10, column 2, paragraph 1, lines 11-13. Ultimately, alternate forms of transportation will be required, but initial product transportation could be handled over the existing highway system.

Page 10, column 2, paragraph 1, line 16. Alternative means of product transportation, other than by truck, should be evaluated.

Page 13, column 1, paragraph 4, line 2. What is meant by "high quality" when referring to oil shale? There are many oil shale deposits in the world that are richer than those occurring in the Piceance Basin.

Page 13, column 2, paragraph 4, lines 3-4. It would be more correct to state that the six lease sites in 1973 offered industry an opportunity to use differing technologies due to the variations in the geotechnical settings.

Page 14, column 1, paragraph 1, lines 2-3. Development on the Utah tracts was not "postponed," but delayed by litigation beyond the lessee's control.

Page 14, column 1, paragraph 4, lines 4-6. Excessively fractured ground had little to do with the decision to seek an alternative resource recovery method on C-b. Room-and-pillar mining would have only recovered less than 50 percent

of the Mahogany Zone, leaving several hundred feet of quality resource unproduced due to limits in room size dictated by any mining under 1,200 feet of overburden. Modified in-situ simply provides a way to recover a portion of the shale oil remaining in sill pillars that would have been left between the various mine levels.

Page 14, column 2, paragraph 2, lines 7-9. It should be stressed that the leasing action will require development in a manner that achieves multiproduct production.

Page 16, column 1, paragraph 6, lines 6-10. This sentence implies that an EIS/environmental assessment (EA) would be required prior to approval of a detailed development plan. This is not the case, although the MMS Oil Shale Office prepares a publically available decision document.

Page 16, column 2, paragraph 2, lines 7-8. Approval of the baseline environmental program and the detailed development plan need only come from the appropriate official within the MMS. In the past, it has been the policy of the Deputy Minerals Manager for Oil Shale to seek Departmental concurrence for approvals of original development plans; thereafter, technical revisions have been handled solely at the field level.

Page 16, column 2, paragraph 2, line 17. Public hearings on lease-required plans are conducted by the MMS on behalf of the Department.

Page 16, column 2, paragraph 2, line 22. BLM concurrence in plan approval is usually sought for original development plans. Subsequent technical modifications do not require such concurrence, although it has been the policy of our Oil Shale Office to discuss major modifications with BLM before taking final action.

Page 18, column 1, paragraph 9, lines 3-5. Unfortunately, the energy alternatives developed for the 1973 EIS may no longer be valid due to the increased emphasis on conservation, biomass, solar energy, and the like.

Page 19, column 1, paragraph 5, line 1. It should be stated that there are methods whereby raptor pests can be "taken" or moved so as not to unrealistically impede development.

Page 19, column 1, paragraph 6. It would be more meaningful to the reader if the affected tract were identified in the legal description here and after item 4. Why are these protected nesting zones on tract C-11 when the only identified raptor nest discussed in this EIS is on tract C-18?

Page 23, column 1, paragraph 1, lines 7-11. With regard to the expressions of interest, the use of the term "offered" seems inappropriate since sites were not offered by either industry or Government, but suggested by industry to the BLM for possible leasing consideration.

Page 23, column 1 and 2, paragraph 4, lines 2-3. It should be emphasized that the generalized development scenarios are by no means the only methods that might ultimately be used in G-11 and C-18. They are intended only to give the decisionmaker a general impression of the types of activities and impacts that might arise from leasing and development of either tract.

Page 23, column 2, paragraph 5, lines 1-2. At the moment, the most important nonagricultural activity in the Piceance Basin is oil and gas production. True, sites have been leased for oil shale and sodium mineral production, but as of yet, commercial operations at these lease sites have not been achieved. Therefore, oil and gas production should be discussed first.

Page 24, column 1, paragraph 2, lines 11, 14, and 18. Off-tract areas would be needed for the initial 30 to 40 years of overburden and processed shale disposal derived from an open pit operation of tract C-a. Thereafter, all wastes could be safely backfilled into mined out portions of the pit. The statement that "uncertainties" underlie the economics of an open pit operation may not be entirely true. Finally, a small noncommercial scale pit could be opened on tract C-a without the need for off-site disposal. Such an approach, however, might reduce the amount of oil shale that could be recovered from that portion of the tract used for waste disposal.

Page 24, column 1, paragraph 3, lines 8-9. The 30-year production life applies to which production rate scenario?

Page 24, column 1, paragraph 4, lines 3 and 6. The scaling factors for a 50,000 barrel per day (bbl/d) open pit operation on tract C-a are somewhat misleading. A 50,000 bbl/d Lurgi surface retorting complex feed from an open pit would probably require as much as 14,000 acre feet/year (af/y) of water. Requirements for mining would be insignificant. A 100,000 bbl/d operation might require a third more water, as there are certain economics of scale. Aerial disturbance cannot be tied to production rate. Whether producing 50,000 or 100,000 bbl/d, it should be assumed that all the exploitable resources beneath the tract will ultimately be produced, less that portion left under the sloping pit wall which might be partially recovered by mine workings drifted in from the pit. The only variable would be the total life of the operation. Nevertheless, a 50,000 bbl/d operation could be carried out on tract C-a for nearly 40 years and only affect 750 acres for the pit while requiring 3,650 acres for off-site waste disposal.

Page 24, column 2, paragraph 2, line 3. It is not a supportable assumption that the future work force will distribute itself similar to employee residence patterns experienced in tract C-a. If the county road now under construction to Rangely is completed, it can be assumed that a majority of the employees from tract C-a will live there due to the shorter commuting distance.

Page 24, column 2, paragraph 4, line 5. The development schedule assumed for tract C-b should be revised. The recently approved Interim Development Schedule calls for commencement of renewed mine development in 1984, followed by surface construction in 1985, with the work force probably peaking in about 5 years.

Page 24, column 2, paragraphs 5 and 6, line 3. Estimated water requirements are probably excessive. For 21,000 bbl/d, water needs would probably be more on the order of 4,000 af/y and about 8,000 af/y for 72,000 bbl/d of production. Again, regardless of the production rate, in time all of the mineable acreage of the tract will be affected (defined for C-b as the leased acreage, less boundary and mine pillars). The only variable would be the area needed for surface facilities and the operating life of the tract.

(164)

Page 25, figure II-1. The map does not show the second 40-acre parcel in the SE 1/4 of section 29, T. 1 S., R. 97 W., across Horse Draw.

(169)

Page 26. These figures should be referred to in the text, or their value to the document is questioned.

Page 27, column 1, paragraph 10, lines 1-3. It should be stated that Multi Mineral Corporation recently terminated their operating agreement with Industrial Resources, Inc., for the right to develop the sodium resources beneath tract C-18. Thus, while they have a valid mining plan, Multi Mineral Corporation may not be able to implement it.

(4)

Page 28, column 2, paragraph 6. Results of air quality modeling are highly argumentative and should be so stated so as not to lend undue weight to the values presented. To be usable in making reasonable estimates of impacts, modeling results should be presented in table form and for 1- to 2-year increments. It should also be noted that each project is on a different development schedule resulting in wide variation in emission quantities. BLM is urged to contact the air quality specialist at our Oil Shale Office for assistance in evaluating modeling results.

(32)

Pages 29-32: To be of value, the approximate area of disturbance depicted in each picture should be stated relative to the total area of the photo. Reference to an appropriate map indexing the photo sites should be given.

Page 32, column 2, paragraph 1, lines 10-14. If the ground water regime will eventually reestablish itself, then it is reasonable to assume that some of the springs and seeps will reestablish themselves.

Page 33, column 1, paragraph 3. Virtually all of the affected oil and gas unit agreements contain stipulations that the oil shale resources must be protected. Language is now inserted into all approved Applications for Permits to Drill (APD's) within the Green River Formation geographic area requiring the oil and gas lessee to plug wells at the time the oil shale developer needs mining through them. Thus, the magnitude of temporary oil shale production loss stated in this paragraph seems overstated.

(170)

Page 33, column 1, paragraph 7. This section on soils indicates that soil losses depend upon the degree of reclamation success. However, this conflicts with the paragraph on vegetation, on this same page, in that the latter paragraph states categorically that the loss of 1,500 animal unit months (AUM's) of forage is temporary--"until disturbed areas are adequately reclaimed." Reclamation of

(171)

100 percent of these AUM's is by no means a certainty, as is clearly indicated elsewhere in the EIS. It is suggested that this paragraph be changed to reflect the uncertainties associated with reclamation of the vegetation systems at this time.

Page 33, column 2, paragraph 4. Under the "no action" alternative, development of tracts C-a and C-b is assumed based on previous discussion. Thus, there will be a recreational displacement effect at these sites, as well as at the sodium lease site.

(164)

Page 34, column 2, paragraph 1, line 9. Replace the dash in "NW-NE" with a slash "NW/NE" to imply the two major joint sets.

(6)

Page 34, column 2, paragraph 3. What would be the incremental additions to air pollution emissions from tract C-11, and how much earlier (when) would modeling predict violation of PSD standards?

(2)

Page 34, column 2, paragraph 5, line 7. Oil shale resources will also be lost to required boundary pillars.

(164)

Page 35, column 1, paragraph 1, lines 3-8. For direct mining, resource recovery/loss figures do not agree with values on page 63, column 2, paragraph 6.

(2)

Page 35, column 1, paragraph 1, lines 2-20. The manner in which possible resource losses relative to various development scenarios is presented in highly speculative and should be so stated. Results of recent MIS tests on tract C-a suggest recovery efficiencies of up to 68 percent within the rubble column, making it nearly as efficient as room-and-pillar mining on paper. Efficiencies for "true in-situ" is anyone's guess and probably ought to be handled simply by stating that it would be somewhat less than for MIS. True in-situ method might work under certain conditions even better than direct mining for recovery of soluble sodium minerals over a thick column of resource. Finally, the picture painted by these numbers is so dismal that one wonders if any leasing should occur.

(164)

Page 35, column 2, paragraph 1, line 4. "Agricultural land" must be contextually defined. It is probably used here to define marginal irrigated hay lands and upland range grazing lands.

(172)

Page 35, column 2, paragraph 3, lines 11-13. The statement about soil impacts does not agree with values in table IV-7, page 129.

(155)

Page 35, column 2, paragraph 3, lines 1-18. The observation made about leasing causing soil damage is misleading, because the described erosive conditions already exist. Development of the tract will, if anything, eliminate large areas susceptible to erosion by filling in gulched areas with mine and process wastes, eliminating them as natural erosion channels.

Page 35, column 2, paragraph 4. The modeling inefficiencies admitted to in paragraph 5 are obviously gross, including the assertion that reinjection of excess mine water would not be practicable. Poor quality water could be readily reinjected into the lower aquifer in the leached zone where ground water is

(164)

already of poor quality. Other development plans reviewed by this office describe a high degree of water conservation through recycling. Thus, only a very small amount of highly polluted process water would have to be dealt with, probably by evaporation in lined ponds. It should also be pointed out that virtually all site water requirements would be met by using mine pumpage, which well exceeds the 8,000 af/y stated as being needed.

Page 36, column 1, paragraph 2, lines 3-5. In the business of environmental management, nothing can be "prevented"--it can be controlled. Monitoring does not of itself "control" anything either, but it can be used to quantify and regulate.

Page 36, column 1, paragraph 4, lines 8-9. Direct mining and modified in-situ have virtually identical impacts on the surface in terms of area required for support facilities and waste disposal. True in-situ may be little better in this respect due to surface preparation requirements for the numerous closely spaced boreholes.

Page 36, column 1, paragraph 7, line 2. The number of deer kills due to vehicular accidents will not be appreciably different on C-11 or C-18, because access routes to the two tracts are largely identical. Actual tract development results only in displacement of resident deer through removal of grazing/bedding habitat. There have been no reports to date of deer being killed on either tract C-a or C-b by construction equipment. Habitat mitigation measures should largely offset loss of grazing land. It can also be argued that tract development may tend to reduce deer loss, as hunting around the developments sites will be discouraged. Experience on the existing tracts also suggests that the deer do not shy away from construction activities once they perceive that there is no direct threat to their safety.

Page 37, column 1, paragraph 2. The paragraph on transportation does not address employee transportation to and from the tract.

Page 37, column 1, paragraph 3. The assumption drawn about transportation impacts relative to method of development cannot be substantiated. A great deal will have to do with the type and form in which products are shipped, market mix, and the like. Recovery efficiencies will play an insignificant role as actual production rates will be set at the maximum the market will bear.

Page 37, column 1, paragraphs 5-10. Unless substantiated elsewhere in this EIS, these paragraphs contain largely unsupportable statements.

Page 37, column 2. Comments above for the discussion of "Alternative C-11" also apply to the discussion of C-18. The discussion of soils is equally poor in that once development occurs, the issue is no longer one of reclaiming the existing terrain, but that resulting from depositing of wastes into natural gulches, which can be done in a manner to achieve virtually any desired slope and aspect that will enhance reclamation. If anything, development of C-11 may have less impact, since the solid regime is less well developed and supports sparser vegetative community than on C-18. Thus, any alteration in aspect would benefit productivity.

Page 38, column 1, paragraph 1, lines 5-10. Resource loss figures do not agree with recovery values given on page 64.

(2)

Page 39, column 1, paragraph 5, lines 2-4. The assumption that development of both tracts will result in doubling of the impact fails to appreciate that, with two operations in close proximity of one another, there will be a tendency to share facilities such as transportation systems. There will also be a tendency for the work force to move among the sites as a particular skill is needed, thus the total population's growth will be as much as a third less than the simple sum derived from each site.

(164)

Page 39, column 1, paragraph 8, lines 4-9. Values for total estimated nahcolite and dawsonite resources do not agree with those given in the table on page 4.

(2)

Page 41, column 1, paragraph 3, lines 13-15. Headframes may not be of the concrete design used on tract C-b, and the size of the retort facilities will depend on the desired rate of production and required ancillary equipment.

(164)

Page 41, column 2, paragraph 1, lines 9 and 10. Since the terms "directly" and "indirectly" have not been previously defined, it is suggested that they be taken out and the sentence made to read: "These rubble filled chambers are then heated at the top with special burners or externally heated gases and supplied with air and steam to initiate, sustain, and control the rate of combustion to retort out the kerogen."

Page 41, column 2, paragraph 2, line 4. These lines would more accurately read "... and crush the oil shale to uniform size underground." Delete "to ship off site."

Page 41, column 2, paragraph 3, lines 1-5 and 7. As previously stated, direct mining and MIS have nearly the same surface disturbance requirements. While MIS may not have associated surface retorts, the facilities needed to handle and scrub the large volumes of off-gas will probably take up as much space as a surface retort train. Delete the word "again" in line 5, as it suggests a not entirely correct inference. Delete "less than" beginning in line 7, as it does not agree with table IV-11 on page 143.

Pages 41 and 41. The discussion of true in-situ would be more appropriate if the reference to dissolving away remaining nahcolite was removed. Heating can also be achieved by direct combustion, as well as by circulating some type of heated working medium, which can be a gas as well as water.

(164)

Page 45, column 2, paragraph 2. It can be argued that leasing should be delayed until after BLM has completed the White River Resource Area RMP. This, however, would delay obtaining actual development and management experience essential to design and operating a permanent leasing program.

(174)

Page 48, Air Quality. Mr. Lee Stevens, of our Oil Shale Office, is available to coordinate reevaluation of this section. He may be reached at FTS 322-0281.

Page 53, table III-2. Are the annual mean sulfur dioxide concentrations for the Rio Blanco tract "26" or 2.6?

(156)

Page 60, figure III-4. The east boundary of tract C-11 should be indicated on the cross section.

Pages 63, column 2, paragraph 1, and page 64, column 1, paragraph 2. Use of the term "discrete" in reference to the zonation applied to the Green River Formation is misleading. The difference between zones is often quite subtle. It would be more accurate to delete the term. Furthermore, we are uncertain as to how the number of stratigraphic zones was derived for the two tracts. Again, it would be more accurate to state that there are a number of such zones without specifying the number.

Page 63, column 2, paragraph 4. Values do not agree with those in table IV-5, page 125, with the latter being in error.

Page 63, column 2, paragraphs 5 and 6. Values do not agree with those in column 1 on page 35, with the latter being in error. (2)

Page 64, column 1, paragraph 7. Values do not agree with those in column 1, page 38, or with those shown in table IV-5, page 125, with the latter two being in error.

Page 65, figure III-6. Show the common north/south boundary between C-18 and C-11 on the cross section.

Page 67, column 1, paragraph 2, line 17. This line would more accurately read, "... product to the formation, currently rendering"

Page 67, column 1, paragraph 3, line 1. This line would more accurately read, "... near the depositional center"

Page 72, column 1, paragraph 3, line 7. Insert before "transmissivities" the statement that the indicated value is based on limited data. (156)

Page 72, column 1, paragraph 4, lines 7 and 8. Robson and Saulnier stated in U.S. Geological Survey Professional Paper 1196, page 12, that vertical conductivity is as low as 7×10^{-4} ft/day. (164)

Page 72, column 2, paragraph 2, line 7. "Recharge" should be "discharge." (2)

Page 72, column 2, paragraph 4, lines 1-3. Since the Mahogany Zone acts as an aquitard to upward movement of the lower aquifer waters, most of the base contribution to stream flow comes from the upper aquifer. (164)

Page 73, table III-9, item 8. "Maximum daily sediment discharge" should be 290,000. This is a record amount often cited in literature. (2)

Page 76, column 1, paragraph 3, line 8. "90,000 tons" should be changed to "290,000" to be consistent with the indicated change in table III-9.

Page 77, column 1, paragraph 1, line 10. The value of 700 lbs/acre is approximately twice that measured at the existing oil shale tracts in Colorado. For

each of the major vegetation types, the discussion should also include a statement as to utilization. The descriptions would also be more complete if a species list were included.

Page 77, column 1, paragraph 4, line 7. The value of 650 lbs/acre seems much too high based on measurements taken on the existing oil shale lease tracts.

Page 77, column 2, line 2. The value of 200 lbs/acre seems too high based on measurements taken on the existing oil shale lease tracts.

Page 77, column 2, paragraph 4, lines 5-7. On which tract was the threatened milkvetch located?

Page 81, column 1, paragraph 5, lines 1-5. The described location of the raptor nest is not within the two areas suggested for protection on tract C-11.

Page 100, figure III-18. Lease numbers for locations 24 and 25 are not listed in the index. Locations of any active or abandoned wells should be shown, as well as any applicable unit boundaries.

Page 101, column 1, paragraph 3, line 1. Insert "and associated minerals" after "Processing of shale."

Page 101, column 2, paragraph 2, lines 9-11. The need for surface disposal is far more complex than the result of simple mechanical swell of the oil shale from crushing. Mine voids usually cannot be filled to full height. Certain mine workings would probably never be filled due to their continued use as haulage ways. The double handling of materials in and out of the mine might also make it economically prohibitive to move large quantities of waste material back underground.

Page 101, column 2, paragraph 3, line 8. The relationship between failure to obtain compaction of the spent shale and problems with the "natural cementation" is not clear.

Page 101, column 2, paragraph 3, line 1. This sentence is confusing and should be rewritten.

Page 102, column 1, paragraph 1, lines 4-7. Admittedly compactions will increase slope stability. However, slope stabilization can also be achieved by limiting slope angle by establishment of a vegetative cover and by attention to drainage diversion.

Page 102, column 1, paragraph 2, line 4. While it may be possible to construct stable processed shale banks with slope angles as high as 2:1, it is not practical to vegetate slopes of that angle. By keeping slopes 3:1 or less, both bank stability and reclaimability will be enhanced regardless of the degree of compaction.

Page 102, column 1, paragraph 5, line 5. Shale would probably have to be heated well above 900°F to obtain optimum decarbonization and calcination of the carbonate minerals.

Page 103, column 1, paragraph 1. Seepage into and through processed shale disposal piles can be diminished by placing a layer of soil-like material over the waste, as evidenced by results from test site R-3 on tract C-a.

(2)

Page 103, column 2, paragraph 2. Experience on the existing oil shale lease tracts suggests that it would be impractical to leach the large volumes of processed shale to reduce pH. At best, the shale can be moistened in the post-retort quench cycle to a level that will enhance pile compaction appreciative of the manner in which the pile will be constructed. Thereafter, the most effective method to minimize leachate production would be to blanket completed portions of the disposal pile with native "soil-like" material to a sufficient depth wherein available moisture (rain and snow) will tend to move only within the artificial soil horizon. A capillary break of coarse material (unretorted shale rubble or native sandstone) would be provided beneath the soil horizon to minimize uptake of salts and to discourage plant root growth into the processed shale beneath.

(177)

Page 103, column 2, paragraph 4. It is doubtful that 75 to 85 percent of the processed shale could be placed back into mined out areas, even when considering the saline zone where removal of nahcolite will increase the mine void space available for backstowage of processed shale due to the volume of mine openings that would have to remain open for haulage and ventilation.

(93)
(176)

Page 104, column 1, paragraph 1. MIS would provide somewhat less space for backstowage than direct mining, because a large portion of the original mine void is bulk filled with shale during the rubblization process to create individual retort chambers.

(2)

Page 104, column 1, paragraph 4. It is erroneous to suppose that total surface area disturbance for processed shale disposal could be diminished by piling processed material within those areas used for mine support facilities (hoisting, support buildings, retort areas, etc.). These facilities will be required throughout mine life and for some period thereafter to support mine abandonment activities. We suggest deleting this discussion.

(178)

Page 104, column 2, paragraph 5. Suitable plant growth material should not be limited to only fine soil material. Experience on the existing Federal oil shale tracts suggests that even pieces of the flaggy Uinta ragolith can be used to blanket processed shale piles, as it rapidly breaks down into finer material due to natural weathering and mechanical breakage by earthmoving equipment. Even large chunks of material used for the capillary break at test plot P-3 on tract C-a showed considerable physical deterioration after only 3 years of weathering.

(155)

Page 105, column 2, paragraph 3, lines 10-12. The recommendation that all processed shale be consolidated to "rock-like" form is both impractical (likely is unachievable) and, based on test plot studies on the existing Federal oil shale tracts, unnecessary. It is recommended that this statement be deleted.

(2)

Page 105, column 2, paragraph 4, lines 4-5. It should be stressed throughout this document that the NEPA process does not stop once the EIS is accepted in final form. The lease-required detailed development plan goes far beyond the

(162)

EIS in describing anticipated site-specific impacts and mitigation measures. Also, like an EIS, it is subject to public review and hearings before final action is taken by the MMS mining supervisor for its approval and implementation.

Pages 109-121. The discussion of the impacts of the proposed project on air quality addresses air quality impacts primarily in terms of visibility impairment, total suspended particulates, CO, SO₂ and NO_x. The aerial release of trace metal vapors, other metallic complex gases, polycyclic aromatic hydrocarbons (PAH), and other toxic organic compounds known to be associated with the development of oil shale are not addressed. The data base used to develop other oil shale EIS's of a programmatic nature contains significant information on the hazardous byproducts of oil shale development relative to their impacts on workers and the general public. We believe these issues should be addressed in this EIS. Since we understand that these issues are being addressed in other oil shale EIS's currently under development, we suggest that their discussion in this EIS is important from the standpoint of consistency.

(141)

We also feel the modeling results need to be carefully reevaluated. We encourage BLM to work with Mr. Lee Stevens, our air quality specialist in the Oil Shale Office, in their reassessment. We question the omission of all possible oil shale development site emissions from the regional modeling runs, as those new source sites included by BLM in modeling suggest that BLM may know more about the timing of these projects than can be currently substantiated. The use of illustrative figures like IV-2 is encouraged.

Page 121, column 2, paragraph 3. While this may not be the appropriate place in this EIS, it should be pointed out that oil and gas development and oil shale mining are not mutually exclusive actions, nor does mining prevent construction overtop mined out areas. Mining and petroleum production proceed together in other parts of the country and are mandated under the multiple resource use management practices of BLM. Virtually all of the unit agreements for oil and gas contain stipulations that require the driller to protect the oil shale resource and to abandon wells at the time the oil shale lessee may need to mine through them.

Page 121, column 2, paragraph 4, lines 8-10. Increases in resource recovery efficiencies are usually attained at a given site after development begins and the ground conditions become more fully known through actual mining experience. Thus, delaying leasing on the assumption that greater resource recovery can be achievable at a later date is not a totally substantiable position.

Page 121, column 2, paragraph 5, lines 1-4. The meaning of this statement is unclear.

(179)

Page 122, column 1, paragraph 5, line 10. The statement that current mining and development practices will result in a permanent loss of 80 percent of the estimated resource implies that there would be, over time, no advance in extractive technologies that would allow at least some production from unmined intervals. It is suggested that this inference be deleted.

(164)

Page 122, column 2, paragraph 4. It should be pointed out that mining across the breadth of an approximately 8-square mile oil shale tract will take decades, affording adequate time for oil and gas exploration and production to take place on the further reaches of each tract prior to conflicting with shale oil and sodium mineral production.

(2)

Page 123, column 2, paragraph 1. Geokinetics reports that true in-situ tests from shallow buried oil shale have reached their recovery efficiencies of as much as 44-50 percent. Efficiencies would drop off rapidly with increasing depth due to reduced ability to create needed permeability. The equity process takes advantage of the natural permeability in the leached zone that resulted from formation brecciation as ground water removed soluble minerals. Superheated steam is circulated between a pattern of well points to break down the kerogen in the shale. To date, success with this process has not been noteworthy, largely due to equipment problems and still poorly understood thermal dynamics of heating the shale in place.

(164)

Page 124, column 1, paragraph 4, lines 4-7. While wastage of resource is always a possibility with untried technology, the methodology for efficient oil shale and saline minerals recovery from the Piceance Basin will not be developed without an opportunity to operate directly on the resource. Under the prototype program, there are adequate lease safeguards to enable the MMS to suspend operations at any time that it should become apparent that reasonable resource conservation cannot be attained.

Page 124, column 1, paragraph 4, lines 7-12. Concurrent oil and gas production is already provided under the multiple resource management practices of the BLM. There is no technical reason foreseen at this time that would preclude oil and gas drilling and production either in advance of or subsequent to oil shale and sodium mining. Existing unit agreements require that the oil and gas lessee temporarily plug and abandon any wells at the time the oil shale lessee would need to mine through them.

(155)

Page 124, column 1, paragraph 5, lines 4-7. Proper boundary pillar layout and design would preclude off-tract subsidence fracturing of the resource interval irrespective of whether the mine workings were backfilled or not.

(164)

Page 124, column 2, paragraph 4. Partly because the Interior Department cannot permit off-site waste disposal without legislative authority, development of tract C-a has been suspended by the MMS appreciative of the far greater resource conservation that would be attained by open pit mining.

(167)

Page 125, table IV-5. In order for this table to coincide with figures in chapter II, the column under "direct mining method" should contain the following values:

(2)

C-11	2.59 barrels	.614 tons	.155 tons
C-18	2.3 barrels	.564 tons	.172 tons

Page 127, column 2, paragraphs 2 and 4. The inference that any development of the tracts would "significantly" or "materially" damage the water supply to the alluvial valleys of Ryan or Yellow Creeks appears to be an overstatement of reality based on experience gained from existing tracts C-a and C-b.

Page 128, column 1, paragraph 4. The assumptions made about soils impacts in this paragraph need careful explanation. Properly designed and implemented reclamation would not only largely mitigate loss of soil productivity, but could radically enhance overall forage production and protection of soils from erosion.

(164)

Page 128, column 1, paragraph 5. Reclamation research on the existing oil shale tract and elsewhere do show a reduction in stockpiled soil biotic activity in more deeply buried portions of the piles. If soil stockpiles are revegetated, nutritive and microorganism activity is maintained near the pile surface. When surface and more deeply buried material are mixed during reclamation, overall soil biotic activity rapidly reestablishes itself. Thus, the inference made in this paragraph is overstated.

Page 128, column 2, paragraph 2. Again, the implications made in this paragraph are overstated. Tests at the Colony site prove that spent shale can be directly revegetated. Admittedly, a great deal more attention must be paid to leaching down salts and initial irrigation to achieve direct revegetation where the processed material has been blanketed with native soils. Since even coarse material derived from the sandstones of the surface forming, Uinta Formation can be used as a growth medium, the assertion that only about 15 inches of soil material would be available in the disposal area cannot be substantiated as limiting blanketing depths. BLM is urged to contact the range biologist and reclamation specialist at the MMS Oil Shale Office in order to bring the conclusions in the soils section more into reality.

(180)

Page 130, figure IV-8. The instantaneous restoration of water level noted in the text and implied by the curve in this figure after pump shutoff is not completely realistic. It would take years for the aquifers to completely recover.

(121)

Pages 131-142. The discussion of the impacts of the proposed project on ground and surface water quality omits a discussion of potential water quality degradation and public health impacts relative to the release and leaching of PAH, other toxic organics, and heavy metals such as arsenic and lead. As mentioned above, the oil shale data base contains significant information on the hazardous byproducts of oil shale development relative to their potential impacts on the general public. We understand that these issues relative to water quality are being addressed, or at least mentioned, in oil shale EIS's currently under development and suggest that their mention in this EIS is important from the standpoint of consistency.

(2)

Page 131, column 1, paragraph 3. Since reclamation of either tract would afford the opportunity to modify the prevailing aspect, the assumption stated in this paragraph cannot be substantiated.

(163)

Page 132, column 2, paragraph 5, lines 9-12. Complete early dewatering of the interval to be mined is neither practical nor required. The advancing mine workings will act as a drainage system, minimizing the requirement for dewatering wells. If attention is paid to maintaining competent roof stone while mining the Mahogany Zone, there may be no need to directly dewater the overlying upper aquifer. Mining below the dissolution surface should encounter dry conditions that can be preserved by sealing the shaft liner into the upper salt beds. Thus, the modeling results described in this section may not represent field conditions encountered during mining. (164)

Page 133, column 1, paragraph 3. This paragraph is misleading. Regardless of the mining rate, dewatering will only be of significant concern in the immediate area of new development. Thereafter, the mine workings will tend to act as their own drainage system. Fully developed portions of the mine can be allowed to rewater, thus limiting the actual area of significant dewatering to the active mine panels.

Page 134, column 1, paragraph 1, line 10. "Hydrogen Carbonate" should be "bicarbonate." (2)

Page 134, column 1, paragraph 2. The inference of this paragraph is that leachate carried by ground water will not be altered chemically over the travel path by interaction with unaffected strata. This will, of course, occur and may significantly reduce the deleterious quality of leachates by the time they reach the surface. (164)

Page 134, column 2, paragraph 7. This paragraph implies that post abandonment monitoring of ground water impacts should be carried out for hundreds of years.

Page 135, figure IV-9. Does the shaded area on this figure reflect dewatering from only C-11 and C-18, or from existing tract C-a as well? (2)

Page 137, column 1, paragraph 2, lines 10-12. Piceance Creek already experiences periods of no flow due to agricultural diversion to irrigate the hay meadows at a time when no significant dewatering is occurring from oil shale development. (165)

Page 137, column 2, paragraph 2, lines 4-5. The fact that the hydrologic model assumed perfect connection between the aquifer and surface water systems should be stated at the beginning of this EIS to place all inferences on hydrologic effect into proper perspective. (164)

Page 138, table IV-10. For Piceance Creek, why is the predicted depletion less for 50,000 bbl/d than for the "no action" alternative?

Page 140, column 2, paragraph 3. It seems contradictory to state that the IDS of Yellow and Piceance Creeks will increase as a result of reduced streamflow attributed to mine dewatering and then to state that the same effect will cause a reduction in salinity in the Colorado River. Further explanation is needed. (2)

Page 149, column 2, paragraph 4, line 6. How was the figure of 36,000 acres of impacted wildlife habitat derived? This equals more than the total leased

acreage for all of the Federal oil shale tracts in the Piceance Basin, including the two proposed for leasing. This figure also seems to fail to take into consideration mitigative actions, such as increasing the carrying capacity of surrounding undisturbed areas as is being done by the lessees of the existing oil shale tracts.

(90)

Page 150, column 1, paragraph 1, lines 1-15. Pinyon-juniper, at best, is not a nutritious forage and is usually resorted to by deer only as a last resort when tall standing shrubs are buried by accumulating snow. The statement made here fails to consider that an overstory could be more quickly established by using superior, fast growing nursery stock (tublings) and that only about 4 feet of height is needed to provide adequate cover. Furthermore, attention to terrain contouring during reclamation can be used to provide cover for large mammals in deference to tall standing vegetation.

(164)

Page 150, column 1, paragraph 5, lines 1-3. This is the first and only place where the possibility of on-tract housing is discussed. If this is considered to be a likely possibility, further discussion is warranted in chapter IV.

Page 151, column 1, paragraph 3. At best, impacts to the wild horse population should be short term, as it is our understanding that BLM will have the last of them rounded up by 1988.

Page 151, column 1, paragraph 5, line 2. The statement that increase in traffic results in an equal increase in the number of accidents involving wildlife is true to the extent that there is a rough correlation between numbers of vehicles using basin roads and deer road kills. There are many other factors that also affect the number of kills, as the rest of the paragraph indicates. We suggest that the word "equals" be deleted.

Page 141, column 2, paragraph 1, lines 6-9. Employee busing should be discussed in greater detail in the socioeconomic part of the EIS.

(182)

Page 152, tables IV-15 and IV-16. It is assumed that "low" and "high" refer to production rates of 25,000 and 50,000 bbl/d, respectively. What is the range of confidence limits on these numbers?

(183)

Page 154, column 1, paragraph 2. Initial mine dewatering may make more water available to surface uses. Later, properly designed water management programs should greatly minimize any adverse effects on habitat utilization.

(164)

Page 170, column 2, paragraph 5. This paragraph belongs under "Housing" in the preceding column.

(2)

Page 171, column 1. This column belongs under the section on housing in the first column on page 170.

Page 178, column 2, paragraph 2. While increased rail traffic to handle oil shale related materials may not significantly affect the existing mainline system, the effect on use of bottomlands along the Colorado River for sidings and storage yards in the Rifle area might be of some size. We suggest that BLM review the product transportation section in the original detailed development plan for tract C-b.

(1)

Page 186, column 2, paragraph 7. It should be stressed that, while 1,200 to 6,800 acres might be removed from native vegetation production during the life of the operations, not all of the acreage will be out of production at any one time. In fact, compliance with air quality regulations alone will necessitate concurrent reclamation to achieve compliance with particulate standards.

(184)

Page 187, column 1, paragraph 2. There is also a potential, although remote, for loss of wildlife through accumulation of mineral salts in the soils and vegetation that might reach hazardous levels over time. Routine monitoring and attention to waste water disposal practices should assure that the potential for such impact is very low.

(164)

Page 189, column 1, paragraph 5. The conclusion reached in the paragraph on geology is contrary to preceding statements in this EIS. At present, probably about 75 percent of the total resource might not be recoverable. Based on the normal learning curve for actual development experience, recovery efficiencies should improve significantly. Modified in-situ currently offers a way to achieve improvements in overall recovery from direct mining by retorting shales that would be left unproduced between the mine levels. To some extent, true in-situ offers the same potential for secondary recovery from well points developed from mined out levels.

(2)

Page 190, column 1, paragraph 3. Without an opportunity to attempt commercial production of oil shale, as is afforded by the prototype program under rigid environmental controls, improvements in extractive efficiencies will be further delayed.

(164)

Page 192, column 1, paragraph 1. A major shortcoming of this EIS is that pipeline transportation of products is not addressed, nor are likely corridors for pipelines and powerlines.

(166)

Page 223, paragraph 3, item 4. This is the same statement that appears in the last half of paragraph 4 on page 220, and it does not need to be repeated.

Page 226, paragraph 9, section 4(A), line 2. This line should read, ". . . exploration plan, a stabilization, and/or revegetation plan for all areas to be disturbed"

(164)

Page 229, paragraph 7, item (D), lines 10 and 11. This should state the design storm for which containment must be provided.

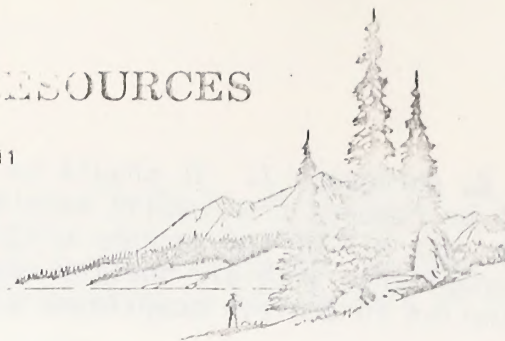
Page 234, paragraph 1, line 2. Reference to "with concurrence of BLM" should be deleted. This is an understood practice pursuant to Secretarial Order 2948.

If you have any questions concerning our comments, please contact Mr. Eric Hoffman, of our Oil Shale Office, on FTS 322-0281. Thank you for the opportunity to comment on this document.

Erwin R. Wyatt
for Andrew V. Bailey

DEPARTMENT OF NATURAL RESOURCES

D. MONTE PASCOE, Executive Director
1313 Sherman St., Room 718, Denver, Colorado 80203 866-3311



46
Geological Survey
Board of Land Commissioners
Mined Land Reclamation
Division of Mines
Oil and Gas Conservation Commission
Division of Parks & Outdoor Recreation
Soil Conservation Board
Water Conservation Board
Division of Water Resources
Division of Wildlife

September 16, 1982

Mr. John Singlaub
Oil Shale Project Team Leader
Bureau of Land Management
White River Resource Area
P. O. Box 928
Meeker, Colorado 81641

Dear Mr. Singlaub:

For some time, the State of Colorado has supported the offering of a multi-mineral lease in the Piceance Basin. We are pleased that the BLM has issued a draft EIS and is moving to offer a lease.

The detailed comments of state agencies on the draft EIS are attached. As they state, the environmental impacts of multi-mineral development cannot be predicted with certainty because the techniques which will be used for mining, retorting, upgrading, and environmental control have not been tested extensively, especially on a commercial scale. Reasonable monitoring requirements and strict application of standards for environmental protection are necessary.

The State will make its recommendations about what should be offered for lease at the time of the Regional Oil Shale Team meeting, scheduled for December. At this point, we would like to point out three concerns with the proposed lease stipulations.

- The inclusion of a stipulation concerning socioeconomic impacts is most welcome. However, as drafted, the stipulation is inadequate. We recommend that at least the stipulation concerning socioeconomic impacts, transportation and applicability of local land use laws, included in recent coal leases in the Green River-Hams Fork region, should be included in future prototype oil shale leases. (77)
- In view of the significant impacts on wildlife, the BLM should consider including the Green River-Hams Fork wildlife stipulation on prototype oil shale leases. (185)

John Singlaub
September 16, 1982
Page two

- o The firms which nominated the tracts have publicly expressed support for a stipulation requiring development of nahcolite and dawsonite as well as oil shale. Such a stipulation should be attached to the lease, since the purpose of this lease is to test multi-mineral technologies.

(27)

We have additional concerns which relate to the minimum acceptable bid on the tract and to diligence requirements. The Department of the Interior should obtain a fair market value for the tract which includes the value of the nahcolite and the dawsonite as well as the oil shale. In calculating the minimum acceptable bid the Department should also give serious consideration, as a matter of businesslike management of a public resource, to the public costs that will be incurred by development of the resource. This would include the costs to the federal, state, and local governments of mitigating socio-economic impacts of development. As you know, the state's portion of the bonus payment and royalty from a lease are deposited in the Oil Shale Trust Fund, which is an important source for financing of public facilities needed to accomodate the development of oil shale properties.

(186)

Setting the minimum acceptable bid for a multi-mineral lease will not be easy. We strongly suggest that the Department specify the criteria used in setting the minimum acceptable bid and that there be an opportunity for public review and comment before the lease sale.

Cordially,

Monte Pascoe
D. Monte Pascoe
Executive Director

DMP:ak
Attachments

STATE OF COLORADO

COLORADO NATURAL AREAS PROGRAM

Department of Natural Resources
1313 Sherman Street, Room 718
Denver, Colorado 80203

Phone (303) 899-3311



Richard D. Lamm
Governor

D. Monte Pascoe
Executive Director

Carol J. Fustmueller, Ph.D.
Program Director

September 20, 1982

Mr. John Singlaub
Oil Shale Leasing Project Manager
U. S. Bureau of Land Management
White River Resource Area
P.O. Box 928
Meeker, Colorado 81644

Dear John:

We request your consideration of the following comments on the Prototypy Oil Shale Leasing Program DEIS submitted by the Colorado Natural Areas Program (CNAP), Colorado Department of Natural Resources.

The Colorado Department of Natural Resources and the Bureau of Land Management have a memorandum of understanding which describes a process for the identification and protection of those areas managed by BLM which qualify as state natural areas (e.g., possess unique natural characteristics of statewide or national significance). The Natural Heritage Inventory is managed by The Nature Conservancy for the CNAP. As you know, BLM contracted with The Nature Conservancy (TNC) to perform field surveys in 1982 in the Piceance Basin on the occurrences of rare, threatened, or endangered plants. The final report for this field work will be submitted by TNC to BLM on October 1, 1982.

The initial analysis of the data collected by TNC during the 1982 field season confirms three locations of Astragalus lutosus (dragon milkvetch), a Category 2 species (a sensitive species requiring additional data for consideration for federal listing by U. S. Fish and Wildlife Service) occurring on the proposed lease tracts C-11 and C-18. Preliminary indications from the data analysis are that no officially designated threatened or endangered plant species occur on the proposed lease tracts. We concur with statements made in the DEIS on Threatened and Endangered Plants (pages 77 and 145).

Mr. John Singlaub
September 20, 1982

Page Two

Once the TNC report is submitted to BLM, and following an analysis of this report by CNAP, a further statement by CNAP will be submitted to BLM if it is determined that:

1. The status of Astragalus lutosus is such that BLM should implement protective measures on the three known populations on these tracts of this species prior to any surface disturbances on these tracts.
2. The data collected during summer of 1982 identify and support the need for protection of rare or quality native plant communities on either or both of these tracts.

Thank you for the opportunity to comment on this issue. If you need additional information, please contact me.

Sincerely,

Carse Pustmueller

Carse Pustmueller, Ph.D.

Director

Colorado Natural Areas Program

CP/ljc



DEPARTMENT OF NATURAL RESOURCES

D. Monte Pascoe, Executive Director

MINED LAND RECLAMATION DIVISION

DAVID C. SHELTON Director

Richard D. Lamm
Governor

September 14, 1982



Oil Shale Project Team Leader
Bureau of Land Management
White River Resource Area
P.O. Box 928
Meeker, Colorado 81641

To Whom It May Concern:

The Colorado Mined Land Reclamation Division has reviewed the Draft Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program. Below are comments regarding those areas with which the Division deals in our regulatory framework. The majority of the comments relate to pages 98-105 and 131-142.

It will be clear from our comments that we find some problems with the draft. However, we wish to emphasize our recognition that many of these problems stem not from the leasing program but from the experimental nature of the oil shale industry itself. Clearly, with proper monitoring and research we can all benefit appropriately from the knowledge gained -- and that is, in fact, your purpose in establishing the prototype program.

1. We are concerned with the light treatment given to the siting of spent shale disposal piles. The decision as to where the spent shale will be located is the most important decision. The location and configuration of the pile and its relationship to physical, chemical and biological environments will determine what designs and construction techniques are used and the eventual impact the spent shale will have on the environment. (111)
2. Throughout the document it is assumed that irrigation will take place. We are not sure that irrigation is advisable both from a revegetation point of view, or from a geotechnical and a geochemical point of view. (187)
3. On page 101 under the heading, "Spent Shale and the Shale Processing Waste Disposal", it is indicated that processing waste other than those that are considered to be hazardous under R.C.R.A. will be disposed of concurrently and in the same manner as retorted shale. This may or may not be possible or advisable depending on the characteristics of that waste and the effect those wastes would have on the retorted shale disposal pile. Under the same heading, it is stated that the factors affecting disposal practices of shale wastes involve expansion, compaction, cementation, permeability, seepage and leachates, and that these factors are directly related to the retorting process. Certainly this is true, but perhaps of more importance is the site where the disposal will occur. (111)
4. The discussion of compaction of spent shale on page 101 does not include the variables of siting and pile configuration. Whether or not compaction is necessary for slope stability will be dependent on the configuration of the pile. It should be noted that compaction in lower zones may not be necessary due to consolidation resulting from the overlying materials.

5. Under the heading, "Permeability and Seepage In Spent Shale Disposal Piles" on page 102, it is stated that permeability of the disposal piles is directly related to the compactive effort the pile receives and the type of spent shale being compacted. This may be true for the upper zones in the pile, but in the lower zones, consolidation may be the ultimate variable which dictates permeability. Under the same heading on page 102, it is stated that seepage into spent shale disposal piles is directly related to permeability. In addition to the permeability, the rate of seepage or infiltration at the surface of the pile will be affected by evapotranspiration. In fact, it may be possible to design a pile such that evapotranspiration would, on the average, equal infiltration, thus resulting in near-zero infiltration from the surface.

(188)

6. On page 104 under the heading, "Above Ground Shale Disposal", it is stated that a capillary barrier would also be necessary to prevent upward migration of soluble salts if not leached below the root zone. It has not been proven that the capillary barrier would be effective in the long-term, nor has it been demonstrated that leaching of the salts to a zone below the root zone will be effective in the long-term.

(189)

7. Ground Water Quantity

No Action Alternative (pg. 131)

Rio Blanco at lease tract C-b has used reinjection of water which was dewatered from the mine and also discharged this water to streams to augment water supplies. If such practices, or a combination of practices, were to be used during future mining at C-a and C-b, the alternative impact to the quantity of ground and surface waters may be considerably less than reported in this section.

(190)

8. Ground Water Quality

No Action Alternative (pg. 133): Effects of Mine Dewatering (pg. 134)

These sections allude to the improvement of ground water quality of the lower aquifer (B-Groove) during the dewatering of this aquifer. This improvement will be the result of mixing of higher quality water from the upper aquifer (A-Groove). This scenario, however, does not take into account: 1) the degradation of A-Groove water through the leaching of soluble minerals within the Mahogany Zone and the Upper B-Groove; 2) the loss of higher quality water from the upper aquifer; 3) the economics of having to drill wells deeper to obtain ground water of lesser quality; and 4) the discharge or reinjection of water of poor quality during dewatering. The improvement of water quality in the lower aquifer, if it occurs at all, will be of little benefit to water users because of the depths to water. Therefore, this scenario appears to be of little significance as an environmental benefit of mine dewatering.

(2)

In-situ retoring and backfilling of mine workings during mine dewatering may also accelerate the degradation of upper aquifer water, and also introduce soluble toxic organic and inorganic constituents not presently found in the lower aquifer. This water may require additional treatment before discharge.

9. Surface Water Quantity

Surface Water Modeling (Pg. 137)

The use of a surface water flow model to predict the effects of mining on the quantity of water at the confluence of the White and Green Rivers spreads the effects of mining too far from the area of the most significant impacts. Water in the White River and its tributaries within Colorado presently have been over-appropriated. Any impacts within the upper basin of the White River

September 14, 1982

should be given more emphasis, as these impacts will be magnified through the entire White River system downstream of mining.

10. Surface Water Quality

No Action Alternative (Pg. 140) and Mining (Pg. 140)

The analysis contained in the "No Action Alternative" and the analysis in the "Development Alternative - Mining" of impacts to surface water are not consistent. The "No Action Alternative" section alludes to an increase in dissolved solids due to dewatering at C-a and C-b, whereas the Mining section alludes to a decrease in salt loading due to dewatering. To be a valid comparison, the analyses in these two sections should be made consistent (e.g., either comparisons of dissolved solids or salt loads).

(2)

11. Processing (Pg. 140)

Toxic heavy metals should also be discussed, because of their potential impact to the quality of ground and surface water.

12. Disposal of Spent and Raw Shale (Pg. 141)

Raw oil shale piles are not necessarily spoil piles and should not be grouped with retorted shale as a disposal problem because of the very different characteristics.

Other factors which should be considered in evaluating the quality of leachates and surface water from spent or raw shale piles are:

1. the thickness of cover placed over the reclaimed piles;
2. the use of liners under the piles;
3. the drainage system established around and over the piles;
4. sediment control systems located below the piles;
5. the engineering properties of the spent shale as related to slope stability and erodibility;
6. the engineering properties of the raw shale;
7. the geochemistry of the raw shale; and
8. the geochemistry of the spent shale.

13. Leachates from Surface Disposal Piles (Pg. 141)

Due to the small particle size and high solubility of spent shale, leachates from spent oil shale piles will probably not have low concentrations of sodium, calcium, magnesium, and sulfate. The contribution of these elements to both surface and ground water systems may be significant. The presence of high amounts of alkali earth elements in marlstone and the temperatures produced during retorting will greatly alter the pH of the raw shale. Changes in pH may, in turn, mobilize toxic heavy metals at high pH. The mobilization of toxic heavy metals is a function of the retorting process employed, and the initial geochemistry of the raw oil shale. Stipulations requiring detailed geochemical analyses of the raw shale and the spent shale should be imposed on the leasee.

14. Runoff from Surface Disposal Piles (Pg. 141)

The quality and quantity of runoff is also a function of precipitation patterns. With about 50% of the precipitation occurring as snowfall, infiltration of melt waters into the piles is significant during snowmelt. Runoff is concentrated in periods of snowmelt and high energy thunderstorm events. The analysis, including high evaporation rates, is inappropriate since most percolation of water into raw shale piles and spent oil shale piles will occur during periods of low evaporation (e.g., snowmelt). Stipulations should be imposed on the lease to ensure adequate surface drainage over and around the piles,

(2)

September 14, 1982

adequate drainage of ground water from under the piles, and adequate controls to minimize infiltration.

15. Mitigation (Pg. 141)

The Division of Mined Land Reclamation has not favored the construction of diversion drains under or within spoil piles. Such drainage systems are subject to failure by corrosion, collapse, and clogging. Such systems would, thus, require long-term maintenance beyond the period of time the mine is in operation. The Division would prefer well engineered surface drainage systems around and across reclaimed and active piles. Well engineered underdrains are usually required to control ground water infiltration into the spoil piles.

Another mitigative measure which should be considered is the covering of the spoil pile with an adequate mantle of non-toxic soil and rock material to ensure adequate revegetation and erosion control.

Heating of the kerogen-marlstone (oil shale) to over 800°C is unlikely to produce sufficient insoluble silicates, since Colorado oil shale is primarily a carbonate rock and has very little silica. Heating calcium and magnesium carbonates to these temperatures may produce highly alkaline calcium and magnesium oxides.

The incorporation of retort waste water and other processing waste waters into piles should be allowed only with a full understanding of the geochemical and hydrologic consequences of such disposal.

The last paragraph under "Mitigation", page 141, should be changed to read:

If the above measures are incorporated, pollution of surface and ground water resources from leachates and contaminated waters may be minimized.

The following impacts of mining and oil shale processing were not considered in the analysis:

1. The cumulative impacts of mining oil shale and soluble sodium minerals on water quality, and
2. The effects of highly toxic catalyst wastes from retorting and upgrading facilities.

Summary

The proposed leasing of tracts C-11 and C-13 as prototype projects should be handled as large experimental practices. The actual impacts of any development of oil shale in Colorado is purely speculative at this point in time. As the development of oil shale technology advances, there should be an equal advancement in environmental assessments and mitigative measures. To ensure that environment impacts of oil shale development are fully assessed, all facets of mining, dewatering, retorting, and disposal of wastes should be extensively analyzed and monitored during the development of the technology. It appears that the lease stipulations recognize the experimental nature of the oil shale industry and require the necessary monitoring.

Thank you for the opportunity to comment on the EIS.

Sincerely,

David C. Shelton

David C. Shelton
Director

STATE OF COLORADO
Richard D. Latta
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE

Jack R. Grieb, Director
6060 Broadway
Denver, Colorado 80216 (825-1192)



46c

M E M O R A N D U M

TO: Steve Ellis
Colorado Clearinghouse

FROM: Al Whitaker *AW*
Wildlife Program Specialist

SUBJECT: Draft Supplemental EIS, Oil Shale Leasing Program, BLM

DATE: September 1, 1982

This agency has reviewed the above referenced document for content and accuracy. We offer the following comments.

1. The document gives a very accurate description of the existing wildlife environment and the impacts upon wildlife due to the proposed action. We emphasize that the document states that the impacts will be serious and long lasting.
2. We cannot see that a need for the proposed action has been proven. Indeed, nothing will happen on the proposed Federal leases that could not take place on existing private oil shale holdings.
3. The section on Uncommitted Mitigation on page 190 is well done and must be included as a stipulation of any future Federal oil shale lease, for at least partial protection of the State's wildlife resources. (192)
4. A viable alternative to No. 3 above would be inclusion of the wildlife stipulation contained in the Green River--Ham's Fork Coal leases. However, we prefer use of the uncommitted mitigation package as a lease stipulation. (185)
5. In the Uncommitted Mitigation section, busing of workers not only reduces highway mortality but also greatly reduces poaching.
6. If the proposed action is carried out, we prefer leasing of only Unit C-18 over C-11 or both.

ag

cc: Pete Barrows
Jim Morris

200

STATE OF COLORADO

DEPARTMENT OF AGRICULTURE

1525 Sherman Street
Denver, Colorado 80203
(303) 866-2811



Richard D. Lamm,
Governor
J. Evan Goulting,
Commissioner
Donald Svedman,
Deputy Commissioner

MEMORANDUM
82-270

DATE: September 1, 1982
TO: Steve Ellis, Colorado Clearinghouse
FROM: Jim Rubingh, Colorado Department of Agriculture
SUBJECT: COMMENTS ON EIS FOR PROTOTYPE OIL SHALE LEASING PROGRAM

Agricultural Commissioner

Naioma Benson,
Sterling

Ben Eastman,
Hotchkiss

John Malloy,
Denver

Elton Miller,
Fort Lupton

Don Moschetti,
Center

William Stephens,
Gypsum

William Webster,
Greeley

Clede Widener,
Granada

Kenneth Wilmore,
Denver

Colorado Department of Agriculture's comments are as follows.

1. Table IV-6 on page 126 is misleading. It states that there is significantly less conversion of cropland under Alternatives C-11, C-18, and the Combined Alternative than under the No Action case. Page 35, however, states that in addition to the land lost under the No Action alternative another 910 to 1,150 acres of agricultural land would be lost in the C-11 case. If Table IV-6 is meant to represent cropland losses in addition to the No Action alternative, it should indicate so in some manner.
2. The EIS should point out that much of the states orchard land is within Mesa County. Any projects which encourage additional urban development will threaten these unique farmlands. (The Soil Conservation Service considers orchard lands in Colorado to be unique if they are not classified as prime. In Mesa County all orchard land has been classified as prime.)

(2)

Orchard land in the state declined from some 15,000 acres in 1967 to 10,000 acres in 1979. Further losses of orchard acreage due to urban development could significantly harm the Colorado fruit industry.

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SEP 1 1982
DEPARTMENT OF NATURAL RESOURCES

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SEP 1 1982
Division of Local Government



COLORADO DEPARTMENT OF EDUCATION

State Office Building, 201 E. Colfax

Denver, Colorado 80203

Telephone (303) 839-2212

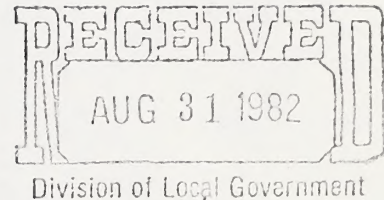
Calvin M. Frazier, Commissioner

DATE: Aug 30, 1982

SUBJECT: NON-STATE ASSISTANCE

REVIEW AND COMMENTS

TO: Bureau of Land Management

TO: ☒ (For Local Applicants)
Division of Planning
Department of Local Affairs☒ (For State Applicants)
Non-State Funds Section
Office of State Planning and Budgeting

Project Title:

SAI Number:

Clearinghouse I.D.: 82-109

Comments Due By: Sept 1

Yes ☒ No ☐ Is this project consistent with the goals and objectives of this agency?Yes ☐ No ☒ Is there evidence of overlapping or duplication with other agencies?

COMMENTS:

No additional comments.

Arvin C. Blome
Executive Assistant
Federal Relations 866 5344

COLORADO DEPARTMENT OF HEALTH

Richard D. Lamm
Governor



Frank A. Traylor, M.D.
Executive Director

MEMORANDUM

TO: Dewitt Joh, DNR

FROM: Paul Ferraro *Paul Ferraro*

DATE: September 15, 1982

SUBJECT: Review of "Draft Supplemental Environmental Impact Statement
for the Prototype Oil Shale Leasing Program"

We have reviewed the Draft EIS, and we would like to discuss our comments in a meeting of representatives from BLM and the Department of Health.

As you know, the Department is going to issue soon its Draft Report, "Assessment of Cumulative Environmental Impacts of Energy Development in Northwestern Colorado". We feel a meeting would be of value in discussing the basic assumptions, methodologies, and results for both the Draft EIS and our report.

I will be contacting John Singlaub of BLM to set-up the meeting. I will let you know the time and place of the meeting.

PF:ts



COLORADO
HISTORICAL
SOCIETY

The Colorado Heritage Center 1300 Broadway Denver, Colorado 80203

August 18, 1982

Mr. Stephen O. Ellis
Principal Planner
A-95 Clearinghouse
523 State Centennial Building
1313 Sherman Street
Denver, Colorado 80203

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AUG 19 1982
Division of Local Government

RE: Prototype Oil Shale Leasing Program, #82-109-Draft

Dear Mr. Ellis,

This office has reviewed the above environmental statement and has the following comments:

1. We request consultation with the Bureau of Land Management on the eligibility of the cultural resource sites located on Tracts C-11 and C-18. 3)
2. We request the opportunity to review the Gilbert/Commonwealth study currently being conducted on the Piceance Basin. We also request review of the results of the test for accuracy of the predictive model. This office is interested in how the BLM is going to put the predictive model into actual practice. (194)
3. Prior to completion of this study and the testing of its applicability to the Piceance Basin, any areas within the two tracts where ground disturbing activities are to take place should be surveyed for cultural resources if no survey has been completed for the area. (195)

If this office can be of further assistance, please contact the Compliance Division at 866-3392.

Sincerely,

Arthur C. Townsend
State Historic Preservation Officer

ACT/WJG:ss

RECEIVED
AUG 23 1982
DEPARTMENT OF NATURAL RESOURCES

RICHARD D. LAMM
GOVERNOR



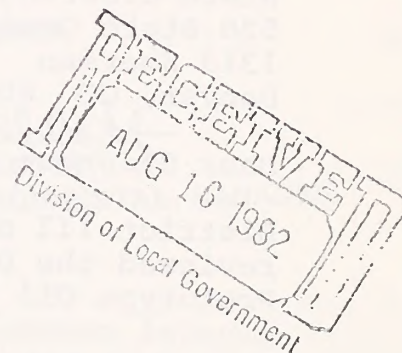
JOHN W. ROLD
DIRECTOR

COLORADO GEOLOGICAL SURVEY
DEPARTMENT OF NATURAL RESOURCES

715 STATE CENTENNIAL BUILDING — 1313 SHERMAN STREET
DENVER, COLORADO 80203 PHONE (303) 866-2611

August 12, 1982

Mr. Stephen O. Ellis
State Clearinghouse
1313 Sherman St., Rm. 523
Denver, CO 80203



Dear Stephen:

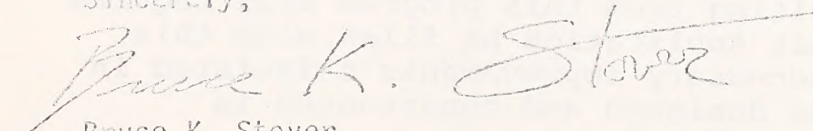
RE: EIS #82-109 DRAFT,
OIL SHALE LEASE TRACTS C-11, C-18

We have reviewed the supplemental EIS for additional prototype oil shale leases in Rio Blanco County. The document adequately outlines the impacts to water, mineral and other natural resources which can be expected to occur if one or both tracts are developed. Impact to local surface and groundwater quantity and quality appears to be a significant problem in the proposed lease area. We concur with the recommendation that zero discharge programs for leachates and retort waters be adopted for these tracts.

We would also like to emphasize the impact on mineral resources should these tracts be developed. As stated in Chapter IV, the lease tracts contain the thickest sequences of nahcolite/dawsonite bearing oil shales in the Basin. Current estimates are that 70% to 80% of the resource in the lease area would be lost using present mining technology.

All long-term impacts to natural resources should be carefully weighed during the decision making process.

Sincerely,


Bruce K. Stover
Engineering Geologist

vt

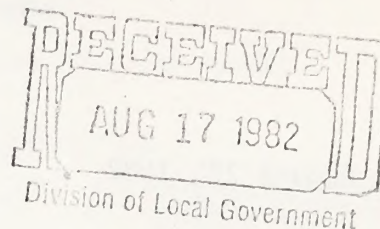
STATE OF COLORADO

DEPARTMENT OF HIGHWAYS

Grand Junction, Colorado 81502
(303) 242-2862



August 13, 1982



Mr. Stephen O. Ellis
State Clearinghouse
520 State Centennial Building
1313 Sherman
Denver, CO 80203

Dear Stephen:

District III of the Colorado Division of Highways has reviewed the Draft Supplemental EIS (DSEIS) for the Prototype Oil Shale Leasing Program and has the following general comments.

As our interest is primarily in transportation-related impacts to the State Highway System, we would request that leasing/mining alternates be developed which result in the least damage and congestion on the State highways serving the oil shale region.

If oil shale lessees elect to haul products/equipment, etc. on the State Highway System, we will be requesting specific improvements and financial assistance in the repair and/or maintenance of State highways resulting from oil shale leasing companies hauling activities.

As noted in the DSEIS, major improvements to the State Highway System would be very expensive to implement while very necessary in many areas (SH 13 north of Rifle, SH 64 west of Rangely); therefore, we recommend alternative transportation modes for product movement be developed and worked into early plans for the oil shale leasing program.

In addition, any new access points onto the State Highway System resulting from this program will require that an Access Permit Application be filed with this District and that necessary improvements stipulated in the access permit be designed and constructed in

(77)

Mr. Stephen O. Ellis
August 13, 1982
Page 2

accordance with the requirements included in the State
Access Code (copy attached).

We appreciate the opportunity to review this document
at this time.

Very truly yours,

R. P. MOSTON
DISTRICT ENGINEER

Laurence R. Abbott
By LAURENCE R. ABBOTT
DISTRICT ENVIRONMENTAL MANAGER

LRA/jme

Enclosure

cc: Clevenger
Atchison
Moston/Sturm
Bradbury
Kier
Spanicek
Campbell
File



OFFICE OF THE STATE ENGINEER
DIVISION OF WATER RESOURCES

1313 Sherman Street-Room 818
Denver, Colorado 80203
(303) 866-3581

September 1, 1982

TO: Stephen O. Ellis, State Clearinghouse

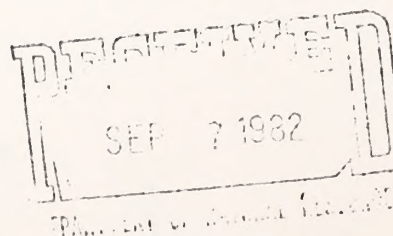
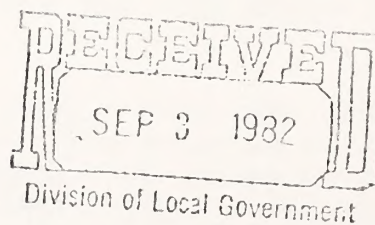
FROM: Hal D. Simpson, P.E., Assistant State Engineer *H.D. Simpson*

SUBJECT: Draft Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program.

As requested, our office has reviewed the EIS for the leasing of one or two additional prototype oil shale leases in the Piceance Basin. In general, we believe the EIS is well presented and adequately addresses the issues that concern our office at this stage of planning. We will review any specific water right or augmentation plan application when it is filed in Water Court.

We do suggest the following revision to the EIS. Paragraph 2 of page 36 states a water augmentation plan will be required under state water law to replace lost sources of water due to mine dewatering. Though in effect this statement is probably correct, it would be more accurate to state that any losses of water which would result in injury to senior appropriators must be replaced. Also, as stated later in the EIS, all augmentation plans that would involve the Piceance Basin must be approved in Division 5 Water Court.

HDS/JRH:pkf



SOHIO

SOHIO SHALE OIL COMPANY

50 SOUTH MAIN STREET
SALT LAKE CITY, UTAH 84111
TELEPHONE 464-1111

September 20, 1982

Mr. John Singlaub
Prototype Leasing EIS Team Leader
Bureau of Land Management
White River Resource Area
P. O. Box 928
Mecher, CO 81641

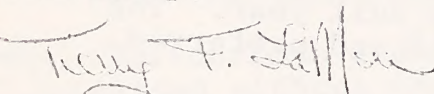
Dear Mr. Singlaub:

Sohio Shale Oil Company appreciates the opportunity to express our comments on the Draft Supplemental Environmental Impact Statement (DEIS) for the Prototype Oil Shale Leasing Program.

Detailed comments on the air quality, socio-economics and hydrology segments of the DEIS are attached. These comments identify significant inadequacies in the data and evaluations presented in the DEIS. Such inadequacies should be addressed and corrected, particularly if BLM expects to use the same baseline information, assumptions and evaluations in the permanent leasing program EIS.

Again Sohio Shale Oil Company appreciates the opportunity to comment. If you have any questions concerning our comments please do not hesitate to call me.

Sincerely,


Terry F. LaMore

TFL/ks

Supplemental DEIS - Prototype Oil Shale Leasing Program

Air Quality

1. Would the USEPA or the State accept the use of the TAPAS model?
2. Did BLM consult EPA of the State regarding the selection of models?
3. How does TAPAS compare to EPA models and to other sophisticated complex terrain models?
4. In the air quality impacts section. BLM briefly discusses the modeling approach and its shortcomings much as conservatism and absolute-worst case. This should appear at the beginning and be more thoroughly discussed, since the assumptions made in the modeling are most likely the cause of the large impacts predicted. It is important to note that in the Air Quality Technical Report (Dietrich, et. al.), the authors readily identify the shortcomings and also say that detailed analysis may yield different results. Also, the conclusions of the technical report are that maximum development may approach or exceed national ambient air quality standards. This conclusion seems to be lost in the BLM document, as they say that the no-action alternative results in standard and increment violations.
5. In comparing this DEIS to the Uintah Basin EIS, I have found discrepancies in source data. Emission rates for projects are not the same. Also, the number of projects included in each report is significantly different.
6. In the prototype DEIS, selected meteorological conditions were used and meteorological data from the area were input into a wind model. Basically, they selected a set of conditions (4 m/sec, West, and E stability) and the wind model gave flows for terrain effects. In the UBDEIS, actual meteorological data were used as well as a complex terrain wind model to give simulated meteorological conditions for a full year. The UBDEIS approach is much more sophisticated and preferred.
7. In the prototype DEIS, the contractor did everything possible to predict maximum impacts. In their modeling, they assumed that the input meteorological conditions persisted for 24 hours. This was due to insure maximum impacts in wilderness areas. This approach is extremely conservative. For example, the EPA Valley model is considered overly conservative and should be used only for screening. In the short-term Valley model, the meteorological conditions for worst case, although input as lasting 24 hours, are actually calculated as occurring six hours.

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8. The TAPAS model used is a Gaussian Puff Model (GPM) which, according to some contractors, overpredicts short-term (24-hour) impacts by a factor of 5. This overprediction by the GPM is referred to in the technical report. As an example, I have compared predictions from the two documents. In the prototype EIS, the 24-hour SO₂ impact at Rifle is 865/g/m³ while the Uintah Basin report predicts a range of 1-11/g/m³. There are a number of factors that could result in this difference and include emission rates, sources, meteorological data, and modeling techniques. (34)
9. The prototype DEIS predicts some rather high NO_x impacts on a 24-hour basis. However, there is no 24-hour standard for NO_x. Thus, it is completely out of line, in my opinion, to compare these results to the annual standard. In the Uintah Basin DEIS and support document, it says that NO_x was evaluated and found to be insignificant. Why is there such a large difference between the two documents? (83)
10. In the prototype DEIS, the contractor used the GPM for all receptor locations. Others have reported that GPMs overpredict near point sources (5 km). In the Uintah Basin report, Complex I was used for near source impacts. (247)
11. For the Uintah Basin DEIS, the contractor, SAI, says that, if all Utah and Colorado projects proceeded at the high level, there is a small but nonzero probability that Class I increments in Flat Tops and Mr. Zickel would be exceeded. This is a substantially different view from the one gotten after reading the Prototype Draft EIS. (247)

Socio-economic

1. Analytical tools commonly utilized for such analysis have not been employed. This leads to an unsubstantiated evaluation. (36)
2. Implications and possibilities of negative impacts are discussed without the employment of empirical data and defensible methodology. (130)
3. Positive benefits such as increased tax base, jobs, etc. are incompletely addressed in the DEIS. (124)

Hydrology

1. The uncertainties in modeling the hydrologic systems in the Piceanse Basin need to be addressed in more detail in the DEIS. The models employed are largely unvalidated. (135)
2. Extensive data bases, which already exist, should be used in the projections. A realistic perspective is needed in dealing with the modeling uncertainties.

Mobil Mining & Coal Division

48
P.O. BOX 17772
DENVER, COLORADO 80217

A DIVISION OF
MOBIL OIL CORPORATION

PALMER C. FUSELIER
GENERAL MANAGER - U.S.
TELEPHONE (303) 628-6350

September 21, 1982

EIS Team Leader
White River Resource Area
U.S. Bureau of Land Management
P.O. Box 928
Meeker, Colorado 81641

Draft Supplemental Environmental
Impact Statement For The Prototype
Oil Shale Leasing Program

Dear Sir,

This letter is in response to the request by the Bureau of Land Management (BLM) for public comments on its Draft Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program (DEIS) (47 FR 31080, July 16, 1982). Mobil Oil Corporation (Mobil) appreciates the opportunity to respond to BLM's above-referenced DEIS.

The DEIS reflects the Prototype leasing program's focus on demonstrating specific, "untried" technologies. This stems from the apparent conception that other technology alternatives, including direct mining and surface retorting of the oil shale, have already been adequately demonstrated under the Prototype Program, and therefore, are excluded from consideration. In reality, no retort technology has yet been commercially proven and developed.

We recognize the difficulties faced by BLM in dealing with the complexities inherent in the development of the DEIS with the limited time and manpower available. However, we are concerned that the analysis presented in the DEIS appears to contain numerous inaccuracies, which undermine the validity of the DEIS. As it stands, the DEIS is likely to impose unwarranted long-term environmental limitations on future shale development in the Piceance Basin.

We feel the DEIS presents an unrealistic worst case environmental scenario based on overly pessimistic assumptions and an unrepresentative air dispersion model. Furthermore, the analysis does not include alternative scenarios with a range of potential impacts or measures to reduce, mitigate or prevent adverse impacts, as required by NEPA process.

Mobil

EIS Team Leader
September 21, 1982
Page 2

The following briefly highlights our most serious specific concerns.

Air Quality

The DEIS overstates the air quality impacts, particularly with reference to the town of Rifle, Colorado. In general, high pollutant concentrations identified in the DEIS are primarily a function of overly pessimistic input assumptions and the application of a dispersion model that is inappropriately applied to the given topography. Furthermore, most of the impact analysis is based on an unrealistic worst case model and fails to adequately consider the caveats listed in the Technical Report accompanying the DEIS.

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Hydrology

The hydrology sections of the DEIS oversimplify the complex Piceance Basin hydrologic system and project substantial impacts on local surface and ground water based on regional modeling. Application of results of regional modeling to specific sites raises questions regarding the validity of conclusions. This problem is most apparent with regard to Mahogany Zone leakage and interaquifer exchange in the vicinity of Tracts C-11 and C-18, where data is insufficient to establish the results indicated.

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Socioeconomics

The socioeconomic analysis is based solely on population growth and does not address all the factors which will affect the local communities. The economic characteristics of the area are more complicated and a comprehensive socioeconomic analyses should consider the whole range of human and community characteristics and needs. Furthermore, the methodology assumptions used to predict project development, labor requirements, growth rates, and social and economic impacts are unclear.

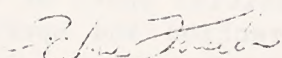
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Additional comments on these and other sections of the DEIS are contained in the accompanying Attachment.

We feel that the DEIS greatly exaggerates the potential impacts of the No Action Alternative. Thus, the projected results of the proposed lease sales alternative are also distorted. We request that BLM reflect the comments contained in this letter and accompanying Attachment in the Final Environmental Impact Statement.

If you have any questions, please contact Grove L. Higgins, Jr. at 303-628-6171.

Very truly yours,


Palmer C. Fuselier

GLHiggins/JJTimlin/ss
Attachment

213

cc: W. H. Marshall - MOC - New York

AIR QUALITY

In general, the impact analysis overstates the potential air quality problems that could arise. Exceedances can be attributed to the overly conservative and unrealistic assumptions used in the modeling. Many of the statements in the DEIS, based on the results of the worst case analysis, fail to include the qualifications listed in the accompanying Technical Report on Air Quality (David L. Dietrich, "Air Quality Impact Assessment for the Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program", July, 1982). More importantly, we believe that the modeling needs to be performed with more realistic technical assumptions. We also question the suitability of the TAPAS model for the terrain encountered in the Piceance Basin. If remodeling is not possible, we believe the DEIS discussion should, at a minimum, include the qualifications presented in the Technical Report.

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Technical Assumptions

We urge that the following technical assumptions be reexamined more thoroughly:

1. The meteorological events leading to these worst case predictions were hypothesized. There is no evidence that such combinations of events occur or have previously occurred in the region.

- It was assumed that winds blew from one direction for 24 hours with no alteration of direction. This meteorological phenomenon does not occur in nature.
- Winds were assumed to blow at a steady 4 meters per second for 24 hours. This meteorological phenomenon does not occur.
- The atmospheric turbulence condition was assumed to be a constant E stability category for the entire 24 hours. This stability category is normally observed under nighttime conditions only and rarely occurs during daytime hours. As a result of using E stability, plume spread is greatly reduced, leading to high predicted concentrations at ground level.
- The mixing height or inversion level was assumed to remain constant for 24 hours at 800 meters. Observed levels vary from 200 meters at night to 2,000 meters during the day. Plumes from tall stacks (e.g., power plants) can rise above the assumed mixing height during the night and thus have very little ground level impact.

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Air Quality Modeling

The BLM model is inappropriate for the terrain encountered in the Piceance Basin. The dispersion model (Topographic Air Pollution Analysis System, TAPAS) used in this BLM study is more complicated than the EPA Gaussian dispersion models usually used for worst case impact studies (e.g., VALLEY). This TAPAS model first generates a gridded wind field. That is, the region is divided into 2.8 x 3.5 km grid squares. Winds enter the grid from the speed direction at the initial speed of 4 meters per second. They blow through the grid, changing direction and speed, as they encounter terrain shapes. The

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grid has a lid imposed on it, the 800 meter mixing height, preventing vertical movement of pollutant higher than 800 meters from the terrain. However, the lid follows the terrain forcing pollutants released from a stack at the 8,000 foot elevation, for example, to behave as though it had been released from the same stack at 6,000 feet if the terrain drops to 6,000 feet downwind. Once the wind direction and speed of each grid is established, the model holds them constant for 24 hours. Puffs of emissions are tracked from each source at 10 minute intervals as they move through the grid. The puffs grow in size and diminish in concentration at a rate determined by the specified turbulence conditions, a constant E stability category for this study. For every puff entering a grid, an equal mass must leave the grid in order for conservation of mass to be maintained without increasing the grid pressure over that of its neighbors. We believe that if the wind encountered certain combinations of terrain, the model establishes a circular pattern, causing the same puff to cross a grid point many times and thus be counted in the 24 hour concentrations many times. This condition would seem to violate the conservation of mass requirement. The abnormally high concentrations predicted for Rifle appear to be the result of such modeling artifacts. Models which allow movement in the vertical as well as horizontal directions are less likely to encounter this problem.

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In the BLM model used in the DEIS, reducing the dimensions of the grid, which should permit more precise estimates, reduces pollutant concentrations in critical areas (phone SS Wise/DG Fox, USDA Forest Service, 8/23/82).

The BLM model has been tested only in areas in California where similar terrain conditions do not exist. Uncertainties such as these should be stated before such definitive statements are made in the DEIS.

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Additional Comments

The projected Class I PSD increment exceedances for Mt. Zirkel and Flat Tops in the baseline case are related to very conservative and unrealistic assumptions used in the modeling.

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Table 1-3, page 20, of the Technical Report lists the coordinates of the sources considered. In addition, these locations are plotted in Figure 1-2 on page 6. The location of the Superior Project should be approximately x/y coordinates 9/22 rather than the indicated 30.5/32.0. Also, the y-coordinate for Rio Blanco should probably be 28.5 instead of the value 18.5 listed in Table 2-3. Rio Blanco, however, seems to be located correctly in Figure 1-2.

(14)

HYDROLOGY

The Hydrology sections oversimplify a very complex hydrologic system. The complexities of the regional hydrology of the Piceance Basin are exemplified by the current studies being conducted by the USGS (Taylor, et. al) to further define, quantify, and modify the work of Weeks and others. The discussion of ground-water hydrology appears to be particularly in need of clarification and/or substantiation. A general lack of data in the text tends to detract from the credibility of the DEIS. The DEIS appears to rely heavily on regional studies rather than site specific data to support assumptions and conclusions.

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The DEIS has projected substantial impacts to both surface and ground-water resources based largely on modeling results by the USGS (Weeks, Taylor, etc.). Application of results of such regional modeling to site specific areas such as Tracts C-11 and C-18 raises significant questions regarding the validity of conclusions. This situation is most apparent with regard to the question of Mahogany Zone leakage and interaquifer exchange in the vicinity of Tracts C-11 and C-18. There is insufficient data to establish site specific leakage of Tracts C-11 and C-18. The issue of leachate transport and migration has also been treated superficially. This attempt to simplify or abbreviate complex issues has resulted in contradictory or confusing discussions.

(2)

Specific comments on the Hydrology sections of the DEIS, discussed by subject area and chapter, are as follows:

Ground Water Quantity - Chapter III, Page 72

1. The DEIS states that the estimates of ground water in storage may "range up to 25 million acre feet." This represents an upper limit. There is no discussion of possible lower limits. There is a wide range of values attributed to this resource by several state and federal agencies which should be addressed.
2. Aquifer properties and associated values are discussed in a rudimentary format. An average value is given for transmissivity (t) of the upper aquifer but no range of data is given. Since the text itself states this is an area of fracture permeability, a wide range of values would be expected and this information is pertinent to the discussion. No source of data or location of testing which produced this data is given. The reference cited (Fox, 1980) does not appear in the Bibliography.
3. The discussion of the hydrologic role of the Mahogany Zone with respect to the upper and lower aquifers is ambiguous. This zone is described as relatively impermeable, then later described as permitting "some degree of vertical exchange of water between aquifers" due to fractures. An estimate of the upper limit of the vertical hydraulic conductivity is presented but no lower limit or range is given. It should be noted that some tests conducted on the Mahogany Zone have found no vertical hydraulic conductivity (Knutson, et.al., 1973, Hydrology of Rio Blanco Site [abs.]: American Nuclear Society, Trans., V. 17, pages 19-20) and no horizontal conductivity (Weeks and Welder, 1974). No discussion is presented as to the site specific hydraulic characteristics of the Mahogany Zone on Tracts C-11 and C-18.
4. No values are given for aquifer characteristics in the lower aquifer. Some data is apparently available but not presented. Transmissivities within the leached zone (lower aquifer) are generally higher than in the upper aquifer as stated in the text. However, limited testing of the lower aquifer within the lease tracts indicate that this is not the case. No explanation or discussion is presented regarding this anomaly.
5. The regional hydrologic flow regimes are described in a rudimentary fashion. Potentiometric head maps would be beneficial to an understanding of the hydrologic regime and relationship of discharge

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and recharge areas to Tracts C-11 and C-18. The statement that the lease tracts are within a discharge area (paragraph 6) conflicts with earlier statements in the text (paragraph 3). (2)

6. The statement that "current use of ground water within the basin is minimal" does not adequately address this consideration. There are numerous adjudicated conditional water rights for ground water withdrawals within this area which have been ignored in the DEIS. It is important to address these rights because it is a very relevant consideration with respect to impacts under Chapter IV. These rights are available from listings in the Colorado State Engineer's Office. (197)

Ground Water Quality - Chapter III, Page 72

1. Water quality is discussed based on samples withdrawn in the vicinity of lease Tracts C-11 and C-18. However, no sample locations are identified. This could be addressed either in the text or through utilization of a map. Since there is a wide variability of water quality within the basin, both vertically within aquifers and spatially across the basin, this information would be of considerable value. Much of this information is available from public records through state or federal agencies.
2. The discussion of fluorides presents an average concentration of 28 mg/l in the lower aquifer. No range of values is given for the 27 wells sampled. The value presented appears very high and, therefore, warrants some indication of ranges of values and locations of wells sampled within the basin. Other data available indicates this average value may be anomalously high ("Ground Water Monitoring Review," V. 2, No. 3, 1982, pages 27-32). (167)
3. The discussion of water quality states that concentrations of barium exceed drinking water standards in 7 out of 11 wells sampled. No data is given to support this or indicate concentrations (or range of concentrations) found. The discussion indicates levels of boron and lithium are high enough to be toxic to plant life; however, no indication is given as to site specific data for these parameters on Tracts C-11 and C-18. Recent data ("Ground Water Monitoring Review," V. 2, No. 3, 1982, pages 27-32) indicates a large variability in boron levels across the basin. No data is provided to substantiate this statement.

Surface Water Quantity - Chapter III, Page 75

1. Surface water flow data is cited in numerous places in the text but no source is identified. It is assumed that this is USGS gaging data and should be indicated as such.
2. Table III-9 appears in the text in numerous places and is cited throughout the surface water discussion. There are several discrepancies in this table. No source of data presented in Table III-9 is provided. Average annual discharge is given in cubic feet per second (CFS) in the table. While this is an acceptable unit of measurement, it would be more consistent with the text to use acre-feet. The average annual discharge given in Table III-9 for Piceance Creek is 10,518 CFS which converts to approximately 20,857 acre-feet per year (AF/yr). This value is inconsistent with the (2)

18,330 AF/yr value presented in the text on page 75. No average values are presented for sediment discharge or TDS values, only maximums and minimums.

3. Table III-9 and page 75 of the text indicate a peak instantaneous discharge for Yellow Creek of 6,800 CFS. The text indicates that this is a flood peak and it can be assumed that this represents an unusual storm event of extreme severity. However, the maximum peak discharge of Piceance Creek with three times the drainage area is only 628 CFS. An explanation of this anomalously high value of Yellow Creek should be provided. (2)

Surface Water Quality - Chapter III, Page 76

1. No reference or source of data is cited in the text for the water quality data given in this section.
2. The text indicates a maximum daily sediment yield of 90,000 tons per day for Yellow Creek as opposed to 2,900 tons per day for Piceance Creek. It appears that the peak sediment load corresponds with flood events on each watershed.

General - Chapter IV

1. The statement that "Impacts for lesser development are described as a percentage of the worst case analysis" is based on the unsupported assumption that a direct linear relationship exists between production rates and ground water impacts.
2. The statement is made that modeling results indicate there could be impacts to "springs, wells and public water reserves." There is no description of the referenced public water reserves and they are not discussed or identified elsewhere in the text. (1)

Ground Water Quantity - Chapter IV, Page 131

1. Under the No Action Alternative the statement is made that "Springs deriving their water supply from the lower aquifer would be affected as a result of large drawdowns." (emphasis added). This appears to conflict with the basic assumption that the lower and upper aquifers are in hydrologic connection via Mahogany Zone leakage discussed elsewhere in the text. If this is the case, all springs as well as surface water supplies could potentially be affected and the effects on any one aquifer would be lessened.
2. The ground water model description needs elaboration. No discussion of methodology utilized is provided so that the reader will have a full understanding of its application. No discussion is provided regarding parameter inputs, assumptions, or boundary conditions used in the modeling process. No discussion is provided as to how fracture permeability was considered and leakage factors were incorporated. If conditions/inputs/assumptions used were the same as the 1974 study (Weeks, et.al., 1974), a statement to this effect should be included. (2)
3. The discussion of mine dewatering and impacts requires extensive clarification and correction of errors. This section would greatly benefit from the inclusion of appropriate diagrams, tables, and maps

to support the discussion. Among the items which should be included are: location map of simulated wells, table of pumping rates vs. time, hypothetical well diagram, and table of model assumptions and parameters.

4. The mine dewatering discussion indicates that complete hydrologic connection is assumed between both aquifers and surface water flows in the basin. While it can be assumed that some leakage occurs between the upper and lower aquifers, the term "complete" may be misleading to the reader. (88)
5. The mine dewatering scenario used in the model indicates 15 wells pumping at 2.5 CFS and 3.5 CFS for periods 1 and 2, respectively. These rates correspond to 1,122 and 1,571 GPM, respectively, which conflicts with the text on page 72. The text indicates that a maximum yield of only 1,000 GPM can be expected from wells in the lower aquifer. The discussion on page 72 and the modeling described on page 132 appear to conflict.
6. The first sentence of the sixth paragraph is ambiguous and should be rewritten for clarity. It is unclear whether the "larger pumping rates" described in the sixth paragraph are greater than the 3.5 CFS of period two or whether the author is referring to the increased pumping during period two.
7. Figure IV-8, page 130, should be relabeled for clarity. Original static water levels should be indicated on the figure. The third period (recovery) should be labeled and model inputs such as T, S, P', and Q should be indicated.
8. The value given in the last (seventh) paragraph, first column of page 132 is erroneous. The value should be 37.5 CFS.
9. The discussion of mine dewatering with reinjection wells is ambiguous. It is suggested that the first and second sentences be exchanged for additional clarity.
10. It is unclear which two streams the text is referring to under "Surface Discharging of Excess Mine Water." The discussion of "bank full conditions" is unclear and requires additional discussion. In view of the normal low flow or no flow conditions experienced on these streams, the probability of excess mine water creating bank full conditions would appear very slight. (2)
11. The use of the term "groundwater" in the first sentence of the text on "Impacts to Existing Sources" should be deleted and "potentiometric surface" or "potentiometric head" inserted in its place. It is unclear whether the 10-foot decline discussed in the text is referring to the upper, lower, or both aquifers. No discussion is presented regarding impacts to undeveloped future rights held in this area in addition to existing sources.
12. The text of discussion under "Mine Development Alternative" refers to the assumption that impacts from 25,000 barrels per day (BPD)

production could be assumed to be one quarter of that of 100,000 BPD. We question the basis for this assumption.

Ground Water Quality - Chapter IV, Page 133

1. The decreases in TDS projected under the No Action Alternative appear to be a temporary phenomena during the mining period. No discussion is presented on temporal conditions or temporal variability of ground-water geochemistry. (249)
2. The broad, generalized statement that "Significant impacts could occur . . . as a result of any production rate." should be expanded in the discussion. (167)
3. We question why "mixing of aquifers" is indicated as critical under "Aquifer Mixing Through Mine Development." The text should specify that the discussion herein refers to upward flow from the lower aquifer to the upper aquifer. According to the text on page 72, this upward flow occurs naturally in discharge areas of the basin. We question how and why this situation is different.
4. The discussion under "Leaching of Subsurface Retort Chambers" addresses the types of contaminants generated and time estimates for leachate transport to Piceance and Yellow Creeks. No discussion is presented as to what effect attenuation and dilution would have on leachate migration over the potential 100 to 200 year period indicated. (2)
5. The discussion under "Effects of Mine Dewatering" addresses the potential for changing ground-water flow direction in the aquifers. It appears that this reversal (change) of flow direction would be a localized phenomena and not basin wide. No discussion is presented on the spatial extent of this phenomena.
6. The discussion of "Ground-Water Use" does not address potential future users in addition to existing users. What impairment could arise to other water right holders presently not utilizing this resource? (197)

Surface Water Quantity - Chapter IV, Page 137

1. The Table cited in the text under "No Action Alternative" should be IV-8 rather than III-10 as given. Table IV-8 is vague regarding what assumptions were used. Footnote 1 does not specify what scenario for development was utilized in Table IV-8. Footnote 2 does not specify what population increases were projected in Table IV-8. (2)
2. The modeling runs conducted by the Bureau of Reclamation for surface water quantity cite a data base of the 1951 period. If this date is correct there is no explanation why only one year of flow data was utilized. (197)
3. We question why ground water utilization was not considered under the modeling effort for "Impacts to the White River." (2)

4. An explanation and discussion is warranted regarding the statement ". . . the assumption of perfect long-term connection between surface and ground water systems." under "Impacts to Piceance and Yellow Creeks" (emphasis added). In addition, an explanation is warranted as to how the model continued to deplete surface water after historical flows were gone.
5. We question whether the 450 CFS shown under the No Action/Net Flow category on Table IV-9 represents the historical average flow available. This should be clarified. Also, it is unclear what baseline flow data was used to simulate future flows derived in Table IV-9.

Surface Water Quality - Chapter IV, Page 140

1. Discussion under the No Action Alternative indicates that mine dewatering at Tracts C-a and C-b will increase total dissolved solids (TDS) in Yellow and Piceance Creek, respectively, as a result of decreased ground water contribution. The discussion in the DEIS immediately preceeding "Surface Water Mitigation" suggests the possibility of utilizing ground water as a mitigation measure to supplement decreased surface water flows. These two ideas appear contradictory and mutually exclusive without some degree of explanation. In addition, if the assumptions stated on page 137 that a perfect long-term connection between surface and ground water systems exists, utilization of ground water to mitigate depletion of surface water would appear to be fruitless unless the source area is spatially and hydrologically removed from the depleted streams.
2. Decreased surface water flows resulting from mining are projected in the DEIS to reduce salinity concentrations in the Colorado River. No data or discussion is presented regarding ranges or projections for this decrease. This information would be helpful to assess the degree of positive impacts resulting from the lease action. The discussion presented also projects total salt load reduction in the White River due to reduced flows from depletions in Yellow and Piceance Creeks. No data or source of data is presented to indicate how the values were derived.
3. The depletion listed for the White River due to reduced flows from Yellow and Piceance Creeks is 4,350 AF/yr. Table IV-9 lists a depletion of the White River at the confluence of the Green River of 8,000 and 16,000 AF/yr for 50,000 and 100,000 BPD production, respectively. While the location of depletions shown in Table IV-9 is further downstream, the two values appear to conflict. No explanation is given.
4. The discussion under "Leachates from Surface Disposal Piles" indicates high concentrations of Ca, Na, Mg, and SO_4 may result from leaching. No quantitative estimate of anticipated concentrations is provided.

(2)

SOCIOECONOMICS

The socioeconomic concerns expressed in the DEIS are identified as major, yet the impacts and future revenues are based solely on population growth. Neither human nor community characteristics or needs are identified. The economic characteristics of the area are more complicated than the DEIS analysis indicates. Comprehensive socioeconomic analyses should consider the whole range of human and community characteristics as well as the interrelationships among these characteristics. Furthermore, the methodology and assumptions used to predict project development, labor requirements, growth rates, and social and economic impacts are unclear.

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Overall, without a clear statement of assumptions and a discussion of methodology, the conclusions presented in the DEIS are subject to multiple interpretations and can easily result in misunderstandings. It is important to specify the criteria used in determining impact rankings. Otherwise, those impacts can become subjective and may be misconstrued. Moreover, inconsistency in the application of the data appears throughout the DEIS and results in a lack of focus and confusion on interpretation.

Assumptions and Methodology

It is not clear what assumptions are used for coal, oil, and gas development; that is, are specific projects included or is a growth rate assumed? Moreover, the methodology and assumptions used to define the study area for social and economic impacts are unclear.

Assumptions on settlement patterns, work force schedules and the number of workers for both construction and operating periods are not discussed for all of the projects assumed in the DEIS base case. Project schedules, work force schedules and levels of construction and operation, and assumptions on settlement patterns are not provided for the DEIS alternatives. It is unclear whether indirect employment and population are included in the projections throughout the DEIS and, if so, what assumptions and methodology (multipliers, settlement patterns, demographic characteristics) were used to determine indirect employment and population.

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The assumptions used to establish the percentage of local and non-local construction and operations workers, family size, and percentage of single and married construction and operations work force are not identified in the DEIS. Moreover, we question whether it is reasonable to assume that secondary population growth will occur in Glenwood Springs and Carbondale, and not in Silt or Parachute.

Inconsistencies

We note that project data, including schedules, work force levels and settlement patterns, are not provided consistently for each project.

The definition of the study area appears to be inconsistent in several sections of the DEIS. For example, on page 4 Rifle and Meeker appear to be included, and on page 33 Rifle, Meeker, and Rangely appear to be included. However, on page 36 Rifle, Meeker, Rangely, Glenwood Springs, Carbondale, Silt, Parachute, and Grand Junction are included.

In addition, the DEIS states that seven towns will be affected (Glenwood Springs, Rifle, Silt, Parachute, Grand Junction, Rangely, and Meeker). Of these, the DEIS indicates that Parachute and Grand Junction would not be "significantly affected." However, Table IV-20 indicates that under certain alternatives Silt, New Castle, Glenwood Springs, and Carbondale would also be affected "insignificantly." If no secondary population was allocated to Silt or Parachute, we question why Silt is identified as being more significantly affected than Parachute.

(200)

Analytical Criteria

In general, we note the absence of identification of the criteria used to establish the social and economic study area. It is unclear whether the criteria developed for ranking social impacts were used for economic impacts, or whether other criteria were utilized as a basis for the statements on the level of economic impacts.

Social and economic community impacts appear to be ranked from "insignificant" to "very severe" throughout the document. These impact criteria are established in Chapter IV, page 165 and were apparently developed for determining social impacts. We question how social impacts can be determined solely on the basis of population growth with no analysis of the existing infrastructure capabilities of the communities. Furthermore, we question how economic impacts can be assessed solely on the basis of population growth with no assessment of the total financial capabilities (revenues and expenditures) of the community and county governments.

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Finally, quality of life is an economic as well as a social consideration. The DEIS does not establish what criteria were considered to measure and analyze changes in quality of life.

Level of Emphasis/Responsiveness

We believe it is important that the analysis address all of the infrastructure elements that provide services. Ignoring significant service providers will distort the results of the analysis.

Social and economic analyses in the DEIS do not discuss county-wide services, problems, issues, or concerns. The counties are an important governing body, primarily responsible for provision of human services, land use planning, roads and bridges, and distribution of funds from federal and state sources. Utilizing the total framework of the existing government entities in the analysis will result in a more useful, accurate document.

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GENERAL COMMENTS ON IMPACT ANALYSIS METHODOLOGY

According to the "Final Impact Analysis Guide, Chevron Clear Creek Shale Oil EIS," prepared by Camp Dresser and McKee Inc. for the BLM, Grand Junction, Colorado, "An Environmental Impact Statement (EIS) is a document prepared by a federal agency to disclose the predicted effects of implementing an action, to compare effects of alternatives to a proposed action, and to provide a sound basis for the selection of a preferred action. Central to the completion of a successful EIS is the selection and use of understandable and defensible impact analysis" (emphasis added).

A definitive comparison of alternatives is an important step in accurate impact analysis. This comparison should justify the selection of the agency-preferred alternative based on results of an interdisciplinary analysis of impact descriptions. This type of approach was attempted in this DEIS. However, the presentation of results was often confusing and should be clarified for purposes of comparison.

Impact terminology is a key factor in implementing a common approach to impact analysis. The use of explicitly defined terminology for impact description is imperative. Terms presented in the BLM Environmental Impact Analysis Handbook (BLM, 1981), Landy (Environmental Impact Statement Glossary: A Reference Source For EIS Writers, Reviewers and Citizens, 1979. New York: IFI Plenum) and Alden (Environmental Impact Assessment. A Procedure For Coordinating and Organizing Environmental Planning. Technical Publication No. 10: Thorne Ecological Institute, Boulder, Colorado, 1974) should be used in the discussion of impacts. Without specific definition, the use of words such as "significant," "severe," "not significant," "may affect," "may not affect," etc. does not sufficiently quantify the impact results. If the above-mentioned references are consulted, the "Magnitude of Impacts" could and should be presented in the form of key words such as "High Positive," "Medium Positive," "Low Positive," "None," "Low Negative," "Medium Negative," and "High Negative." Definitions of each of these key words in the text of the DEIS will allow for a more conclusive, consistent, and definitive interpretation of the results. (201)

The presentation of results of the impact analysis would be much more conclusive if the impacts of each alternative were addressed separately. For example, the Alluvial Valleys section had separate subheadings for the No Action, Tract C-11, Tract C-18 and Combined Alternatives. The impacts for each alternative were easily understood. However, the Wildlife section, as well as many of the other sections, did not have individual subheadings that addressed the impacts of each alternative. In addition, a matrix comparing alternatives, disciplines, and impacts would more clearly summarize the impact analysis process. Use of the matrix presentation is specified in the Environmental Impact Analysis Handbook (BLM, 1981).

GENERAL ENVIRONMENTAL IMPACTS

Floodplains

The discussion of flood potential needs further explanations. A table or listing of flood discharges for drainages cited would be helpful in understanding the document. In addition, no discussion or description is presented as to the methodology and criteria employed to assess flood hazard potential. (115)

The floodplains delineated on Figure III-9 are very general due to the map scale. The areas delineated are based on a 100 year flood event, but no discharge values or method of deriving such are provided. This information would be beneficial.

Agricultural Lands

The DEIS suggests that impacts to agricultural lands could be "significant" as a result of increased population and urban development. However, no quantification of "significance" is provided. (202)

Vegetation

There is no explanation why only a worst case analysis is applied in the discussion on vegetation. Moreover, many statements on revegetation are speculative and not supported by the available literature. In addition, it should be noted that assumptions on water table drawdown in the Vegetation section are inconsistent with comparable assumptions made in the ground water section of the DEIS. (203)

Wildlife

The Wildlife section is not formatted consistent with many of the other sections of the DEIS (see General Comments on Impact Assessment Methodology). In addition, several assumptions addressing loss of wildlife habitat under the No Action Alternative are not quantified through presentation of specific data. We feel it is inappropriate to predict impacts without using supporting information to substantiate statements. (98)

Modifications of quantity and quality of habitats of terrestrial vertebrates must be addressed, at a minimum, by describing acreages of each vegetation type, rating of importance of the species, and evaluating modifications of species diversity and abundance as a result of changes in habitat acreages. (167)

Additional comments on the Wildlife sections of the DEIS are as follows:

1. Paragraph 4 on page 149 states that approximately 36,000 acres would be impacted due to ongoing energy development. This statement may be true; however, no supporting data is presented which specifies where the 36,000 acre figure was obtained. The magnitude of impacts concerning habitat loss and the importance of loss of wildlife habitat are not addressed. Loss of certain portions of wildlife habitat may not be as severe as others. For example, loss of critical winter range or calving areas may have more far reaching impacts than loss of a grassy meadow. To state that loss of any habitat (36,000 acres) is significant does not reflect the true nature of impacts. (98)

Similarly to the discussion above, a quantitative evaluation of acreage and type of habitat lost must be performed in order to accurately assess the impacts (page 149, paragraphs 8 and 9).

2. The DEIS states on page 151 that "An increased number of domestic animals, especially dogs and cats, commonly accompanies this community growth and would result in direct adverse impacts on wildlife populations and distributions." (167)

To the best of our understanding, the above statement implies that dogs may in fact "prey on" or "disrupt normal behavior patterns" of the wildlife in the area. However, a statement similar to the above

implication is never made. The DEIS should not leave the type or severity of the impact to the discretion of the reader.

3. We believe that "poaching" is inappropriately included as an outdoor recreational activity (page 151, paragraph 10). Perhaps "poaching" merits a separate assessment as a potential impact.

(150)

4. In addition, paragraph 10 on page 151 provides no definitive quantitative assessment of the extent of impacts caused by recreational activities.

(204)

5. We do not believe the statement on page 151 that "Increases in consumptive use of wildlife would force the Colorado Division of Wildlife to alter future game and fish management strategies. Adjustments in bag limits, length of seasons and/or number of sportsmen participating would be necessary to prevent over-harvest." is supported with sufficient data in the text.

(2)

Visual Resources

The methodology used in Chapter III to describe the existing visual resources, while not sufficiently defined, is outdated.

Current methodology, i.e., BLM's Visual Resource Management (VRM) system, should have been used as set forth in Manual 8411, Upland Visual Resource Inventory and Evaluation (BLM 1978). The final Visual Resource Management Classes, as defined by the BLM VRM system, define the degree of acceptable or desirable visual change with the landscape and are derived from the combination of scenic quality, final visual sensitivity, and distance zone data. The results of performing a BLM VRM Visual Resource Inventory will yield 5 class ratings for the subject area, i.e., Classes I through V. In the DEIS, however, only three scenic quality classes were utilized, i.e., Class A, Class B, and Class C.

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We understand that the results presented in the DEIS may be the most current analysis performed on the area. However, the evaluation should be performed using the most current BLM methodology. Presentation of the results identified in the DEIS may eventually be misleading and perhaps inaccurate if the most current system of evaluating visual resources is not employed.

Based on the above comments, we believe the impact assessment on visual resources in Chapter IV should be rewritten after the proper inventory is performed on the subject area using the BLM VRM system.

Transportation

The DEIS does not set forth the methodology used to determine the impacts of the various scenarios. At a minimum, we suggest referencing the sources in Tables IV-26 through IV-30.

The discussion on page 10 of the DEIS relating to additional truck requirements for product shipment is overstated since it is planned that syncrude will be transported by pipeline.

Noise

The References section of the DEIS includes a publication (National Academy of Sciences. 1977. "U.S. Department of Commerce, Guidelines for Preparing Environmental Impact Statements on Noise." Washington D.C. U.S. Government Printing Office) which in our opinion should be used as a methodology guidance document in assessing environmental impacts caused by noise. We can only assume that the methodologies described in this document were used in the DEIS. We are unsure, however, how the impact conclusion was reached with no supporting data. We believe that the impact analysis data results should at a minimum be summarized in the DEIS.

(2)

On page 178, paragraph 13, the DEIS states that "Noise levels from operating equipment on-site would be raised from 40-45 db to 80-90 db, at the tract boundary." Baseline data is provided to support the 40-45 db noise level; however, no operating equipment noise specifications are given in the text to support the predicted increase.

No noise isopleths were presented in Chapter IV to demonstrate the difference between existing and projected noise levels. This mapping effort would help support the spatial trends of noise impacts.

DISCUSSION OF THE ALTERNATIVES

In the description of the No Action Alternative in Chapter II, we question the source of the peak production levels for private oil shale development in the Piceance Basin. Due to the potential significance of the analysis of impacts attributable to the No Action Alternative, we believe it is important to specifically list anticipated production dates and levels for each project included and to identify the sources for the estimates. Moreover, since most of the projects considered in the No Action Alternative have been deferred, the No Action Alternative is not realistic.

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In Chapter II of the DEIS on page 27, the 108 acres of topsoil relating to the Multi-Mineral lease is incorrect. It should read "108 acres of total storage including shaft muck and process waste". Furthermore, the 72,000 gallons/day figure used on page 27 is a worst case scenario reflected in Multi-Minerals' mine plan as one possibility (2 wells at 25 gallons per minute maximum).

(156)

MINING METHODOLOGIES

Although mention is made of the possibility of backfilling mined-out areas with spent shale, the DEIS does not address the potential benefits of additional recoveries through mining pillars. Instead, the relatively low extraction ratios likely in mining a deeply buried seam with no ultimate recovery of pillars are stressed.

(69)

A very wide variety of approaches to mining the deeply buried oil shale in the center of the Piceance Basin are described in some detail in "A Technical and Economic Study of Candidate Underground Mining Systems for Deep, Thick Oil Shale Deposits" Quarterly, Colorado School of Mines V. 71 No. 4, 1976 by Hoskins, Upadhyar, Bills and Sandberg. The fact that methods described in

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this report offer promise of higher extraction ratios was not discussed in the DEIS, even though this report is referenced in the DEIS.

The manner in which open pit mining is casually discussed on page 124 is unrealistic. "Front end" investment is normal on any mining project, both underground and surface mining. In the case of surface mining, the magnitude depends on the stripping ratio. The lower the stripping ratio, the lower the "front end" investment. Therefore, the "front end" investment for a surface mine is not necessarily higher than for an underground mine. It is true that the pit boundaries required to remove 1,000 feet of overburden over 2,000 feet of oil shale would be extensive. However, the successful negotiation of backslope agreements with adjoining landowners (as is commonplace on federal coal leases in Gillette, Wyoming) would allow for the extraction of all the resource within the lease boundaries.

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The DEIS overemphasizes poor recoveries of the total in-place resource by either direct underground mining, mine assisted in-situ or true in-situ. However, the resource lost in lower recovery by any of the foregoing methods can ultimately be recovered by a large migrating pit. The statement in Chapter IV that "Proposed plans for a 'migrating' open pit to move through that portion of the Piceance Basin where the overburden is shallow enough to economically recover oil shale, may not affect the lease tracts" is not supported in the DEIS. It is probable that were the tracts mined by room and pillar methods initially, a large migrating open pit could recover the remaining resource at a very high extraction ratio in the distant future. Therefore, the "permanent loss of resource" described on page 38 is reduced considerably from the 84% to 89% range to an estimated 5% to 10%.

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On page 40, sublevel stoping and crater retreat, more commonly called vertical crater retreat (VCR), should be described in more detail. Diagrams are necessary if the methods are to be fully explained.

On page 41, the statement that "Surface facilities consist of permanent shafts encompassed by large cement head frames" should be reworded to more accurately read: "Surface facilities consist of large concrete headhouses at collars of permanent vertical shafts."

(167)

There is an inconsistency in the DEIS between the delivery rate for nahcolite and its annual production from the Multi-Minerals Corporation mine plan, as follows:

Page 122:	1,670,000 tons/year	= 714 days/year
Page 27:	90 trips/day @26 tons/trip	

(155)

There cannot be 714 days in a year.

GEOLOGY

The DEIS does not adequately address the relationship of structural geology and specific structural features in conjunction with stratigraphy of the South Rangely Syncline and the Dudley Bluffs Graben. A structural geology map showing these features should be included.

Additionally, the description of location, richness and mode of occurrence of dawsonite, $\text{NaAl}(\text{OH})_2\text{CO}_3$, throughout the DEIS is not adequately addressed. Instead, dawsonite is discussed in terms of 180,000 tons per acre or a total of 155,000,000 tons. These totals do not indicate whether the mineral is distributed very diffusely through large columns of rock, or whether it is concentrated richly in a relatively thinner zone. This makes a significant difference in its value as a resource and should be addressed in the DEIS.

(2)

SURFACE RECLAMATION AND SOLID WASTE DISPOSAL, SOILS

Several of the statements concerning the characteristics of spent shale, reclamation potential of spent shales, and the availability of suitable plant growth material are misleading and not completely accurate. In general, the statements presented are not inclusive of current relevant research results and are, therefore, not presented in the proper perspective.

Additionally, we believe the section on Surface Reclamation and Solid Waste Disposal fits more logically within the analyses of Chapter IV, Environmental Consequences, than in the discussion of the Affected Environment in Chapter III.

(6)

Additional comments on these sections of the DEIS are as follows:

1. The statement on page 103, "moderate[ly] high retort temperatures, however, will increase the salinity of spent shale ...," is not correct. Bloomfield and Stewart (1981) found no relationship between spent shale leachate concentrations of bicarbonate, sulfate, chloride, sodium, calcium, or potassium and retorting conditions.

2. The statement on page 103, "A pH of 8.5 to 9.0 is considered the level that would inhibit plant growth," needs to be put in proper perspective. Many arid to semi-arid rangeland plant species commonly grow in soils with pH values near 8.5. Some species such as greasewood (*Sarcobatus vermiculatus*) are found in nature growing on soils with pH values near 10 (Rickard, W. H., and Keough, R. F., 1968. Soil plant relationships of two steppe desert shrubs. Plant and Soil 29:205-212). In addition, the pH values of spent shales decrease rapidly when artificially leached or irrigated or when exposed to the weather (Harbert, H.P., III, Berg, W. A., and McWhorter, D.B., 1979. Lysimeter study on the disposal of Paraho retorted oil shale. EPA-600/7-79-188; Richardson, S. G., McKell, C. M., George, M. R., and Gray, G., 1981. Weathering effects on some chemical and physical properties of processed oil shale. Journal of Environmental Quality 10:221-224).

(2)

3. The statements on page 103 regarding leaching of spent shale prior to placement and compaction are impractical. Although the majority of a disposal pile should be highly compacted, the upper portion (3-4 feet) should not be highly compacted so that effective leaching and plant growth would be encouraged.

(207)

4. The statement on page 104, "Small plot studies on reclamation of spent shale piles have been made on topsoil depths ranging from 11 to 35 inches (Harbert and Berg, 1978; Redente and Cook, 1981)," is not completely correct. Harbert and Berg (1978), for example, also had zero soil and 6

inch soil depths over spent shale in their experimental design. It should be mentioned that with leaching, irrigation and fertilization, successful vegetation establishment was accomplished on the zero and 6 inch soil over spent shale plots. However, when all the spent shale revegetation studies are considered, it appears that soil covering does enhance revegetation, particularly when the more alkaline decarbonized spent shales are involved. The minimum and optimum soil depths required for any given type of retorted shale are not precisely known.

5. The statement on page 105 that "Topsoil over spent shale piles would eventually erode, exposing spent shale regardless of placement" is only accurate if the erosion rate is greater than the rate of soil formation (including deposition). Several other factors should be considered. For example, steepness of slope, texture of topsoil materials, erosion control measures, etc., are probably more important in terms of potential short-term erosion. There is insufficient evidence available to make such a definitive statement in the DEIS.

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6. The statement on page 128, "Temperatures high enough (149°F) to kill roots have been recorded on south facing study plots (Harbert and Berg, 1978)," is not accurate. Such temperatures have indeed been measured on south facing slopes at the dry surface of spent shale (soil surface temperatures were only a few degrees lower) in mid-summer, but temperatures are much lower only a few centimeters below the surface. Plant roots below the surface will not be affected appreciably. Theoretically, high surface temperatures could inhibit germination; however, mulches and irrigation are effective in reducing spent shale surface temperature and have been used successfully to establish plants directly on spent shale following leaching of the spent shale (Harbert and Berg, 1978; Harbert, Berg, and McWhorter, 1979; Berg, W. A., Herron, J. T., Harbert, H. P., III, and Kiel, J. E., 1979. Vegetation stabilization of Union Oil Company process B retorted oil shale. Colorado State University Experiment Station Technical Bulletin 135.)

(2)

7. Certain statements on pages 104 and 128 imply that there may only be enough "suitable plant growth material" available on Tracts C-18 and C-11 to cover a spent shale pile with 15 inches of material, while 24 inches is supposedly the minimum soil cover necessary for revegetation. As mentioned in Point No. 4 above, the minimum and optimum cover depths required for adequate revegetation of various types of spent shale have not been established. The evidence available indicates that less soil cover is necessary over lower temperature retorted shales, such as Union B and TOSCO II, than the more alkaline spent shales retorted at higher temperatures, such as Paraho DH, Chevron STB, and Lurgi. The 24 inch recommendation comes from Redente and Cook's (1981) research with unleached Paraho DH spent shale.

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In addition to the effect of the type of spent shale, the actual soil depth needed over spent shale depends on the kind of vegetation desired and whether or not the spent shale is leached. Salt tolerant or shallow rooted species generally require less soil cover over unleached spent shale than salt intolerant, or deep-rooted plant species. Proper leaching with water improves the quality of spent shale as a plant growth medium by reducing its salinity and pH. Thus, less soil cover is required over leached spent shale than unleached spent shale.

(2)

If, for some reason, it was found desirable to cover spent shale with 24 inches of plant growth medium, it would not be necessary to disturb additional acreage simply to borrow soil. Disturbing areas solely for the purpose of borrowing soil is not only unnecessary but is undesirable because the revegetation potential of the borrowed areas would be reduced. Use of waste rock from mine development and construction plus subsoil and topsoil will provide adequate depths of growth media that are potentially as productive as the undisturbed soils of Tracts C-11 and C-18.

(94)

LEASE FORM AND ENVIRONMENTAL STIPULATIONS

1. Oil Shale Lease Form

Preamble Clause

The lease form includes a proposed preamble clause which would subject the lessee to "all regulations hereafter promulgated" by DOI. This provision purports to subject the lessees to future regulation without limitation. BLM should restrict retroactive applicability of the regulations to reasonable nonproprietary regulations.

DOI lacks the authority to amend proprietary lease provisions at will merely by issuing new regulations. The structure of the Mineral Leasing Act demonstrates that Congress intended vested rights under a lease to be invulnerable to defeasance by subsequently issued regulations. The DOI may not rewrite the basic proprietary lease terms whenever and however it chooses, thereby eliminating all stability and mutuality from the lease. BLM should restrict retroactive applicability to reasonable nonproprietary regulations. Such a limitation would not appreciably affect BLM's ability to continually supervise lessees.

If DOI subjects the lessee to all future regulations, such an action could infringe upon private proprietary rights and therefore DOI must compensate the lessee. Some consideration to this concept is given in Section 7(a)(2)(d) of the draft lease. However, the only relief provided is a reduction in royalty payments made by the lessee and then only for environmental compliance and only if the added costs would engender "extraordinary costs" in excess of those in the contemplation of both parties as determined by the lessor. More importantly, the requirement to offset such costs is discretionary to the Department.

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Moreover, the implied ability of the BLM to adjust any lessee's obligations is inconsistent with the readjustment provisions of the Mineral Leasing Act and the lease itself. It is clear that Congress has intended that the Secretary would have the power to readjust the proprietary lease terms only at the time specified, i.e., at the end of the 20-year term. This limitation evidences the Congressional recognition that in order to encourage development of public resources by private initiative, a stable relationship between the United States and its lessees must be provided. Unilateral changes of a lessee's obligations, without compensation, are contrary to the public welfare.

Section 4 - Lease Term

Section 4 of a lease grants the lessee the right to mine the federal oil shale for a period of 20 years and so long thereafter as there is production from the leased deposits in commercial quantities. This language is inconsistent with the Mineral Leasing Act which provides that federal oil shale leases may be granted for an "indeterminate period." Since Congress has yet to establish a fixed production deadline for Federal oil shale leases, it is inappropriate for DOI to take it upon itself to do so.

Despite a lessee's best efforts, it may be impossible to bring an oil shale synfuels project on line by the end of the initial 20-year term. Even if development of the lease has been accomplished prior to the end of the 20-year term, the mandate that there be production in "commercial quantities" could prematurely force lease termination.

The scale and complexity of a commercial plant for the development of oil shale may well take over 15 years before construction is completed. Moreover, once the plant is constructed, there will be a degree of uncertainty as to how it will perform. A period of plant shakedown can be expected as equipment is tested, and, if necessary, redesigned. Environmental performance must be monitored and refined and project economics proven. This could add several years to the initial start-up period and prevent achievement of production in "commercial quantities." (213)

Additionally, the estimated costs of a full-scale commercial plant (50,000 BPD oil equivalent) is presently estimated at \$3 to \$6 billion. The technical risks inherent in the oil shale industry (as evidenced by the recent shutdown or slowdown of several major oil shale projects), coupled with high capital cost, may force companies to plan for phased project development using smaller-scale commercial modules until plant performance can be proven. An oil shale lessee may need to initially construct a module of from 10,000 to 15,000 BPD capacity and subsequently replicate the module after its performance has been commercially proven. Production of "commercial quantities" by the end of DOI's imposed 20-year deadline is unnecessary, unreasonable and incompatible with the multi-billion dollar investments required to put an oil shale lease into commercial production. With the current state of the art, there would probably be a period of time between the initial production of oil shale and the point at which sustained design production rates are achieved. Fixed production obligations during plant start-up would create an unnecessary hardship on a lessee.

Section 7 - Royalties

The draft lease contemplates the imposition of a \$.12 per ton royalty indexed if the shale oil content is above or below 30 gallons per ton and adjusted by an increase or decrease of the same percentage as the Producers Price Index for crude petroleum as compared with the Domestic Wholesale Price Index for crude oil. This royalty option has the advantage of focusing the royalty question on the mined ore, not on subsequent retorting or upgrading steps. It eliminates the possible Pandora's box of problems which might be encountered in having to back out all costs (including the lessee's return on investment) from the point of first sale back to the mined ore. This methodology is simple and fair and should be retained in the Final EIS and should be considered by the Department when finalizing its Permanent Oil Shale Leasing Program. (119)

Section 10 - Development Plan and Diligence Requirements

In the draft lease, an oil shale lessee is required to file a mine plan within three years of lease issuance. Since it is highly unlikely that an operator would be able to complete all the necessary work within three years, this requirement is unnecessarily burdensome and unrealistic.

The coal industry is under this burden due to a statutory requirement, but has repeatedly urged DOI to minimize the amount of information required for compliance since little information is available so soon after lease issuance. DOI's recent coal regulation revisions have taken this concern into consideration. In fact, DOI, in its recent testimony on H.R. 5895 and S. 2704 (which would delete the requirement to submit a mining plan within three years for coal leases), strongly supported repeal of the 3-year mine plan submission provision. (211)

Absent imposition of a statutory requirement applicable to oil shale, the proposed mine plan requirement would be needlessly burdensome and unrealistic. Garrey E. Carruthers, Assistant Secretary, Land and Water Resources, at the August 3, 1982 hearing before the Senate Subcommittee on Energy and Mineral Resources on S. 2704, stated that not only did the Department support repeal of the 3-year mine plan submission requirement, but also that "experience has shown it to be very difficult for an operator to do all the work necessary for permitting a new mine (hydrologic studies and the like). . . within three years." If such a submission is "very difficult" for a coal lessee, it would be even more difficult for an oil shale lessee considering the untested nature of this fledgling industry.

Section 21 - Monopoly and Fair Prices

Section 21 of the proposed lease form entitled "Monopoly and Fair Prices" credits Sections 30 and 32 of the Mineral Leasing Act for authority. Section 30 of the 1920 Mineral Leasing Act provides that the Secretary shall ensure that each lease contains provisions as he may deem necessary to

. . . insure the sale of the production of such leased lands to the United States and to the public at reasonable prices, for the protection of the interests of the United States, for the prevention of monopoly, and for the safeguarding of the public welfare.

The Mineral Leasing Act authorizes the Secretary to include specific lease provisions to accomplish the purposes enumerated; it does not provide blanket authority to put an open-ended obligation subject to the future whim of the Secretary. The MLA does not empower the Secretary to impose price controls in the future or to review and regulate terms and conditions of sales contracts between the lessee and its purchasers. Additionally, BLM should eliminate at least that portion of the clause which would, by lease contract, permit BLM to retroactively apply price control regulations.

If a national emergency warrants some type of price controls or modification of supply agreements, Congress, if anyone does, rather than DOI, has authority to take action. A federal oil shale lessee should not be singled out as a target for government interference in their sales contracts. (75)

Further, this lease provision potentially jeopardizes the lessee's ability to obtain relief through a force majeure clause in its own private sales contract. If price controls or other government regulations on the oil shale sales are subsequently imposed, the acquiescence by the lessee to the lease clause might negate a force majeure circumstance with respect to its sales contract. Unfortunately, the subsequently enacted laws could be deemed to be "voluntarily accepted" by the lessee so a force majeure clause in the sales contract would not provide protection.

DOI intends to lease the prototype oil shale tracts by competitive bid and no bid can be accepted which is less than the "fair market value" of the oil shale. Thus, before the tract is let, DOI will determine the market value of the oil shale. The bidding systems are designed to capture the "economic rent" referred to as "excess profits." DOI already has potential monopoly powers since it controls prices by the rate at which it releases oil shale to the market and by the extent to which it captures the "economic rent". DOI should not include an open-ended lease provision which seeks the ability to reassess market value determinations after the lease is purchased. The anti-trust laws already protect the public from potential anti-competitive activities by the oil shale industry - we feel it is not an appropriate function of the oil shale lease.

Section 25 - Overriding Royalties

The proposed Section 25 of the oil shale lease would limit an overriding royalty interest to 25% of the rate of royalty first payable to the United States. For coal, the arbitrary ceiling of 50% is established. There is no reason given why oil shale's limit is half that permitted for coal. The need for this limitation is highly questionable. If the reservation of an overriding royalty interest will not result in a higher purchase price or impede the production of oil shale, there does not appear to be any public benefit or need for such a restriction.

2: Environmental Stipulations

Throughout the Environmental Stipulations in the proposed lease, reference is continually made to the discretionary authority of the Mining Supervisor concerning his approval of environmental data collection programs. While we believe it is important for the Supervisor to review, discuss, and mutually modify or adopt a monitoring program to fit the objectives of the study with the lessee, we feel that as the stipulations are now written, excessive discretionary authority is being given to the Mining Supervisor. We suggest the Environmental Stipulations be made consistent in addressing the Supervisor's authority by modifying Section 1(C) to include a statement, such as "Stations shall be established through mutual consent of the lessee and the Mining Supervisor based on need, quality and quantity of data program."

Section 1(B) - Changes in Condition

Under the environmental stipulations, DOI provides that the stipulations may be revised or amended by mutual consent. Additionally, "the lessor may amend these stipulations at any time without the consent of the lessee in order to make these stipulations consistent with any new federal or state statutes for the protection of the environment upon their enactment and with regulations issued under those statutes."

Not even Congress has said that all environmental laws upon enactment are automatically and immediately applicable to existing operations. To the extent that a federal or state law is applicable to ongoing operations, the lease clause is superfluous. To the extent it would eliminate any grandfathering protection normally available under the statute, it is an unauthorized extension of authority and should be deleted.

Sections 6(a) and(b) - Cultural Resources and Paleontological Resources

It is not clear whether or not BLM intends to extend the survey obligation to lands not within the lease boundary. The National Historic Preservation Act does not provide that everything that happened in connection with a federally authorized project, e.g., a federal lease, no matter how remote that connection is to the federal lands, is susceptible to the reach of the Act. Caution should be exercised to ensure that any cultural or paleontological survey obligations are restricted solely to within the lease boundaries.

(212)

Section (1)(c)(2)(d) - Flora and Fauna

The text specifies that "daily" movement patterns of fauna must be documented in the monitoring program. We believe that defining daily movement patterns is a requirement that goes beyond the objectives of the monitoring program. Daily documentation of wildlife movement is not overly costly to the lessee; however, it provides little, if any, worthwhile information to the data base. The abundance of data collected for daily year round fauna monitoring, would be confusing. It may be advantageous to monitor daily movement patterns during calving season; however, this should be determined through mutual consent of the Mining Supervisor and the lessee during design of monitoring programs and should not be included as part of the Environmental Stipulations section.

(213)

49
Union Energy Mining Division

Union Oil Company of California
2777 Crossroads Boulevard, Suite 100
Grand Junction, Colorado 81501
Telephone (303) 243-0112



James S. Cloninger
Manager of Administrative Services

September 22, 1982

Mr. John Singlaub
Oil Shale Projects Team Leader
BLM White River Resource Area
P.O. Box 928
Meeker, Colorado 81641

Dear Mr. Singlaub:

We appreciate the opportunity to respond to the BLM Draft Supplemental EIS for the Prototype Oil Shale Leasing Program in Colorado. Our primary concerns, detailed in the attachment to this letter, relate to the disciplines of air quality, socioeconomics, and retorted shale disposal. We believe important inadequacies exist which demand consideration prior to publication of the Final Supplemental EIS. These concerns should also be addressed in the Programmatic Oil Shale Leasing EIS prior to its publication.

Please contact me if you have any comments or questions.

Very truly yours,

A handwritten signature in cursive script that reads "Terrence L. Larson".

Terrence L. Larson
Environmental Administrator

TLL:tw

Attachment

cc: J. S. Cloninger
D. O. Bender

REVIEW OF DRAFT SUPPLEMENTAL EIS
FOR THE
PROTOTYPE OIL SHALE LEASING PROGRAM

I. Air Quality

Review of the draft EIS and supporting technical air quality report indicates that the air quality impact estimates and statements regarding these estimates are technically unsupportable. In this regard, there are three major deficiencies with the EIS. They are:

- A. Summary statements in the draft EIS concerning the air quality impact estimates are misleading to any but the most informed reader.
- B. The analysis of air quality impacts is based upon highly conservative estimation procedures (procedures designed to err on the side of overestimation of the actual impact) which taken together do not approximate real, known scientific and empirically based relationships.
- C. The maximum impact estimates exceed the concentrations of pollutants emitted at sources potentially contributing to these impacts, and thus the model appears to violate the basic principal of conservation of mass.

Each of these deficiencies is significant alone, but taken together they magnify each other resulting in a large overstatement of the potential air quality impacts.

A fourth, more subtle deficiency of the EIS is the absence of any near source evaluation of the air quality impacts which may be associated with the proposed action (i.e. Prototype Leases). This omission is especially important when examined in the light of previous oil shale air quality impact studies which indicate the potential for significant near source effects (Anderson et al, 1981; Latimer & Doyle, 1981; Latimer, 1982). Because the proposed leases represent a fraction (17%) of the total shale oil development under the highest scenario, the regional evaluation perspective tends to focus on the other existing and planned projects (i.e. no action alternative) while ignoring potentially significant near source effects of the proposed action, individually and cumulatively. (2)

Each of the above three major areas of concern, is discussed in greater detail below.

A. Draft EIS Conclusions

The discussion on page 3 of the draft EIS under "No Action Alternative" leads the reader to believe that efforts have been made to not "exaggerate or underestimate" the actual impacts. In fact, in the air quality modeling, decisions were made which were recognized to be conservative. This conservative approach to the impact assessment should be stated prior to presenting the actual model estimates. (4) (15)

The discussion on page 4 on growth in Rifle followed by air quality impacts in Rifle leads the reader to wonder if the air quality impacts result from population growth. In fact, the air quality estimates are based on modeled plume impacts from planned oil shale developments, which appear to be inaccurate (see discussion of item 3).

Also in this same discussion, as elsewhere throughout the EIS, 24 hour maximum NO_x concentration estimates are compared with the annual average NO_2 National Ambient Air Quality Standard (NAAQS). The inference is that the 24 hour maximum exceeds the annual standard by such a large value that a standard exceedance and adverse health effects would result. While the model estimate appears unreal, as will be discussed later, the relationship between maximum NO_x and annual NO_2 concentrations needs explanation. Two factors make the direct comparison inappropriate.

- o Only a portion of the NO_x emitted from the sources will be NO_2 (maximum between 0.76 and 0.93; EPA, 1980).
- o Maximum ground level pollutant concentrations from point sources averaged over a year will be only a small fraction of the 24 hour estimate (between 7 and 4%; Montgomery and Coleman, 1975).

These relationships are supported by empirical evidence and must be factored into any comparison of short term NO_x estimates with the long term NO_2 standard.

Statements in the summary and air quality impact sections of the draft EIS indicate that based on the model results Prevention of Significant Deterioration (PSD) Class I SO_2 increments (24 hours) will be exceeded at Mt. Zirkel Wilderness. It should be pointed out in the EIS that this result is based solely on the modeling of emissions from the existing Craig power plant. Since the emphasis of the draft EIS is on oil shale development, the reader is led to believe that this impact estimate is due to the overall development of the region.

Also, it should be made clearer that the impact estimates at Book Cliffs are solely attributable to modeling of emission from the proposed Southwest Power Plant.

On page 9 of the draft EIS it is indicated that air quality would "deteriorate significantly in Rifle, near the Book Cliffs and within Mt. Zirkel Wilderness Area.". This statement as in similar statements in the air quality section does not recognize the conservatism, and thus uncertainty with which this prediction is made. For example, even if the assessment were accurate, exceedance of Class I PSD increments under a single worst-case condition does not necessarily imply significant impact of important AQRV's at the Mt. Zirkel Wilderness. Consideration of frequency and seasonal variability along with the degree of impact are recognized as important factors in determining significance.

It should also be pointed out that the model results used to indicate significant impacts at Class I areas are not in close agreement with other recent studies which have attempted to estimate the potential constraint to growth of the oil shale industry. Estimates of the maximum oil shale production rate which could be accommodated before PSD Class I increments are approached or exceeded range from greater than 1 million barrels per day (bpd) (Anderson et al, 1981) to approximately 900,000 bpd (Williams and Manging, 1980; and Latimer and Doyle, 1981) to 579,000 bpd for this Prototype draft EIS. Each of these studies have employed conservative modeling principles in estimating class I effects, with the Prototype EIS study being the most conservative of all. Also, the recently released study for BLM's Uintah Basin Synfuels DEIS (Latimer et al, 1982) which contains the most comprehensive and realistic modeling approaches used to address this problem to date indicates that Class I increments will be amply protected at the 1 million bpd shale oil production level. (24)

B. Extreme Conservatism of Modeling Approach

It is recognized that due to the inherent uncertainty of present day air quality models, especially when applied to complex terrain and long transport distances (greater than 50 km) such as in the this case, conservatism in assumptions is justified in order to protect the air resource. However, the modeling approach used to estimate impacts for this draft EIS appears to have selected conservatism over realism in all aspects of the effort and thus has unnecessarily compounded the conservatism of the analysis. The principal areas of concern are the assumptions made regarding plume transport and dispersion. The following items are seen as major weaknesses of the analysis for which the use of conservative assumptions has resulted in a large overstatement of the potential air quality impacts.

- The model used to estimate TSP, SO₂, and NO_x concentrations assumed a constant wind field (i.e., not straight line, but non varying) over a 24 hour period. This approach ignores diurnal influences on plume transport which act daily to transport pollutants emitted in the first several hundred meters of the atmosphere downslope during the night and early morning and upslope during the daylight hours after the inversion has lifted or broken up. The dominance of this transport phenomenon has been observed repeatedly and is fundamental to estimating pollutant transport in complex terrain. The non-varying transport condition assumes that winds will be channeled and diverted by terrain in a constant manner to a single point of maximum impact, during both daytime surface heating and nighttime surface cooling conditions. This is an unrealistically conservative assumption which is not necessarily better than the straight line transport assumption which is recognized as inappropriate for complex terrain situations. In addition, straight line transport models gener-

ally recognize that the plume will meander due to frequent small shifts in wind direction, and this dispersion effect is accounted for by sector averaging. Plume meander is apparently ignored for the purpose of the draft Prototype EIS impact assessment.

- The draft EIS results are based on highly conservative and unrealistic assumptions regarding atmospheric stability, plume dispersion and mixing depth. Based on review of data collected in the oil shale development region (Anderson et al., 1981) stable atmospheric classification over an entire region and day, even a worst-case day, is not realistic. A mechanically induced turbulence would be a neutral atmosphere during the mid-morning and afternoon hours and stable conditions at night. This diurnal change is critical to an evaluation of Class I area impacts since pollutants are only likely to be transported in an easterly direction from the oil shale development region to Class I receptor areas during daylight hours. (79)

Use of the Pasquill dispersion coefficients, while often used, adds further to the conservatism of the results by ignoring terrain induced turbulence. Use of a constant average mixing height may unrealistically affect results at long transport distances by trapping plume dispersion. This average mixing height is much lower than would be expected during the daylight hours when transport of emissions towards Class I areas can occur.

- The visibility analysis performed for the draft EIS is based on the EPA Level 1 screening approach. Since this is a recognized conservative procedure to be used only to exclude the possibility of significant visual impairment, a level 2 analysis must be performed (as a minimum) once the level 1 results show significance. This procedure is important in that there are basic local/regional input data required for the level 2 analysis which are assumed to be the absolute worst-case in the level 1 analysis. The level 2 inputs, which are derived from the study area data, to define local or regional worst-case conditions include:

- wind speed
- atmospheric stability and mixing depth
- time of day and season
- background ozone concentrations
- background visual range
- persistence of meteorological conditions
- topographical effects on plume transport and diffusion (140)

Use of regional input data and the level 2 analysis is not beyond the scope of the EIS if, in fact, an estimate of visual effects specific to the source region is desired.

The visibility results as presented in the draft EIS are generic worst-case and should not be used to provide the general public with an estimate of the effects of the proposed and alternate actions.

- Estimates of acid deposition are based on the assumption that the maximum single point SO_2 and NO_x concentrations estimates at Class I areas is representative of the levels across the area when corrected from 24 hour to annual average conditions. This assumption is very conservative given the modeling approach and multitude of transport trajectories which can occur over a year for the long transport distances between source areas and receptors. Another assumption that a 5:1 ratio exists between 24 hour maximum values and annual averages is apparently based on data for urban areas as reported by Larsen (1973) and should not be used for rural point source related impacts. Because of the fundamental differences in the distribution of urban versus rural point source emissions, the 24 hour to annual average ratio would be much greater than the 5:1 ratio, especially at the long transport distances involved.

Overall, these approaches result in estimates which when presented in the draft EIS without sufficient explanation of their uncertainty and conservative underpinning provide a misleading picture of the air quality effects of both the proposed and alternative actions.

C. Evaluation of Model Results

Based on an evaluation of the initial plume concentrations and the resulting downwind maximum concentrations, it appears that the model estimates do not conserve mass, a basic law of physics. This evaluation is presented below.

The maximum TSP, SO_2 and NO_x concentrations at Rifle are the highest estimated in the region. Due to the location of sources and downwind pollutant isopleths, it appears that the model has estimated these concentrations from the interaction of emissions from sources located in the Parachute Creek, Roan Creek, and Upper Piceance Creek drainages. An evaluation of X/Q values using emission estimates from these sources and the maximum 24 hour concentrations at Rifle for the no-action alternative tends to support this conclusion.

Using the initial plume dispersion assumptions (40- and 40-) and a 4 meter per second wind speed, the initial plume concentrations for each pollutant at the source can be calculated. Based on second law of thermodynamics (which requires that the entropy of a system is always increasing), the peak plume concentrations must decrease as it is blown downwind. Thus, the maximum downwind concentration cannot be greater than the sum of the initial plume concentrations for all sources causing the impact.

In Table 1, the initial plume concentrations for all sources potentially contributing to the maximum impacts at Rifle are presented. The sums of these initial concentrations are also given in this table. Comparison of these totals with the estimated maximum impacts at Rifle indicates that the impact exceeds the initial concentration by a factor of approximately 2 and 4 for the west and northwest wind directions, respectively. It appears that the model is violating the conservation of mass principle by an incorrect buildup of puffs at the point of maximum impact. If so, these results are not only conservative but mathematically incorrect.

II. Socioeconomics

The socioeconomic impact assessment of the proposed prototype leases lacks adequate documentation of assumptions and methodologies. Primary among the inadequacies is the lack of supporting information for the baseline development scenario. The DEIS indicates that seven projects constitute the baseline; however, no project specific employment or production figures are provided. Provision of these figures is critical for evaluation of the cumulative impacts. In light of recent developments in the oil shale industry, a seven-project baseline is extremely optimistic. (36)

Conclusions regarding the magnitude of negative socioeconomic impacts are drawn without citing or referencing any supporting assessment data nor documentation of methodologies or models employed. The discussions of population-related impacts are repeatedly presented in percentages without quantification of absolute impacts. Magnitude of impacts is also discussed in qualitative rather than quantitative terms (e.g. "moderately severe, very severe"). Comments such as "hiring of professional planners is strong evidence (of formalized local decision-making)" exemplify the use of anecdotal rather than empirical data. (130) (216)

Table IV-18, in the DEIS, presents a summary without source of potential social impacts resulting from rapid population growth. No documentation or analysis is provided to support these conclusions. Further, it is unclear whether these potential impacts are applicable to the prototype leases. No consideration is given to the considerable amount of excess capacity and planned capital construction among the jurisdiction in the impact area. (5)

The DEIS lacks proper documentation of a baseline production scenario, assumptions, methodologies and quantification of impacts. Empirical analysis should replace unsubstantiated qualitative conclusions of potential socioeconomic impacts. Without explicit, quantitative documentation of these concerns, the conclusions drawn will be misleading and likely inaccurate.

TABLE 1

Comparison of Initial Plume Concentrations
with Maximum Impact Estimate at Rifle
(No-Action Alternative)

<u>Source</u>	<u>Initial Plume Concentrations (ug/m³)</u>		
	<u>TSP</u>	<u>SO₂</u>	<u>NO_x</u>
Colony	10	58	52
Union	115	103	667
Mobil	60	58	370
Chevron	120	115	740
Cathedral Bluffs	<u>107</u>	<u>93</u>	<u>555</u>
Total All Plumes	<u>412</u>	<u>427</u>	<u>2384</u>

<u>Synoptic Wind Direction</u>	<u>Maximum Impact Estimated (mg/m³)</u>		
	<u>TSP</u>	<u>SO₂</u>	<u>NO_x</u>
West	704	865	4100
West-Southwest	361	352	2223
Northwest	1671	1625	10308

III. Surface Reclamation and Solid Waste Disposal

This presentation of retorted shale properties, reclamation, and associated problems fails to consider relevant research, in addition to alternative design measures, controls, and mitigation measures which will commonly be utilized. As a result, a misleading picture of the problems associated with retorted shale disposal is presented.

Apparently, two assumptions underlie the analysis: that carbonaceous retorted shale is far inferior to decarbonized retorted shale for reclamation, and that compaction to density of 100 pounds per cubic foot is both feasible and essential. First, the stability of any disposal system is insured only by adequate design and construction, and is not dependent upon any one property such as the natural cementation qualities of decarbonized shale. Instead, emphasis should be placed on proper siting, control of surface and groundwater in the vicinity of the retorted shale, and consideration of the unique properties of retorted shale from various retorting methods in the design of a stable disposal system. The concerns over stability, permeability and seepage should be addressed within this overall context. (21)

Secondly, no analysis is provided supporting the implication that 100% compaction throughout each retorted shale pile will prevent the problems of seepage, leachates, and stability while any lesser compactive results will result in those problems. Lacking a comprehensive risk/benefit analysis, this stringent standard seems arbitrarily set and unsupported. (2)

On page 102 under Permeability and Seepage in Spent Shale Disposal Piles, Paragraph 3, it is assumed that a system of liners, drains and catchment basins, to collect leachates from retorted shale piles, is feasible. Neither the necessity for the measures nor their feasibility are substantiated. (2)

On page 103 under Underground Shale Disposal, the statement is made that 75 to 85 percent of the retorted shale could be placed back into the mine. Our information indicates that only 20 to 50 percent of the material can be placed back into the mine. Although this procedure is attractive in that it could increase recovery, it should also be noted that underground disposal is not proven and is considered to be in the experimental stage. Hydrologic and water quality considerations, control of particulates in the mine during transport and placement, and temperature control must all be considered in underground disposal. (39)

Inadequate consideration has been given to alternatives for above ground shale disposal. Successful establishment of plants directly on carbonaceous retorted shale following leaching has been demonstrated (Harbert and Berg, 1978; Harbert, Berg, and McCortner, 1979; Berg, Herron, Harbert, and Kiel, Vegetation Stabilization of Union Oil Company Process B Retorted Oil Shale, Colorado State University, Experiment Station Technical Bulletin 135, 1979). (2)

While soil cover enhances early establishment of vegetation, the studies referenced above have shown that revegetation on retorted shale with 0 to 6 inches of soil can be successful. Also, contrary to the assumption that establishment of shrubs will not be possible under these conditions, shrubs established on the referenced Union Oil CSU revegetation plots are now the dominate species present. Finally, assumptions on the negative effects of high temperatures on carbonaceous retorted shale surfaces ignores alternative treatments such as mulching, irrigation, and the timing of planting. Therefore, high surface temperatures on carbonaceous retorted shale should not be presented as a problem which prevents revegetation. (226)

IV. Committed Mitigation

It appears that stringent and arbitrary wildlife mitigation measures will be imposed without the support of site and project specific impact analyses. Imposition of committed mitigation measures such as the restriction of "human disturbances" during winter months should be imposed only if significant adverse impacts will be unavoidable due to the activities of a specific project, and when these impacts cannot otherwise be mitigated. (66)

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Rio Blanco Oil Shale Company

2851 South Parker Road Suite 500
Aurora, Colorado 80014 (303) 695-2400

RICHARD M. LIEBER
PRESIDENT

A GENERAL PARTNERSHIP
GULF OIL CORPORATION • STANDARD OIL COMPANY (INDIANA)

September 21, 1982

Mr. John Singlaub, Team Leader
Bureau of Land Management
White River Resource Area
P.O. Box 928
Meeker, CO 81641

Subject: Comments on Draft Supplemental Environmental Impact Statement
(DEIS) for Prototype Oil Shale Leasing Program (47 FR 31080,
July 16, 1982)

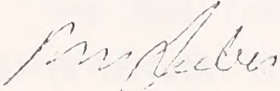
Dear Mr. Singlaub:

Rio Blanco Oil Shale Company appreciates the opportunity to comment on the above-referenced DEIS. Our comments (attached) deal most specifically with the air quality and hydrology elements of the DEIS. However, comments are also provided that deal with waste disposal, monitoring, and threatened/endangered species.

The DEIS presents in many instances an overly conservative analysis and a resultant overemphasis of potential deleterious impacts. The inclusion of additional information or statements to clarify and to qualify the analysis is thus needed to provide a more realistic perspective for your decision-making purposes.

If you have questions regarding these comments, please contact Dr. G.E. Bertolin (303/695-2484).

Sincerely,



R.M. Lieber

GCS:mjr

Attachments

ATTACHMENT

COMMENTS ON DRAFT SUPPLEMENTAL EIS FOR THE PROTOTYPE
OIL SHALE LEASING PROGRAM (47FR31080, JULY 16, 1982)AIR QUALITY

The primary comment concerns the results of the air quality simulation modeling done for the Draft EIS. The modeling predicts that the NAAQS for SO₂ and TSP will be exceeded, the maximum 24-hr NO_x value will be 41 times the annual Ambient Air Quality standard for NO₂, and that the Class I increment for SO₂ will be exceeded at the Mt. Zirkel Wilderness Areas. This scenario is identical for the No Action Alternative (no new federal leasing) as well as the year 2003 High Production Scenario. In addition, the High Production Scenario for 2003 is also predicted to result in violations of the Class I SO₂ increment at the Flat Tops Wilderness Area.

These results are certainly surprising, for no other modeling efforts have predicted so many violations of so many standards. Another recent study done for the BLM (SAI, 1982), combining both Uinta and Piceance Basin pollution studies, predicted a "small, but nonzero probability" that PSD Class I SO₂ increments at Flat Tops and Mt. Zirkel Wilderness Areas would be exceeded. The Class II increments for TSP and SO₂ near the oil shale facilities would be approached, but not necessarily exceeded. No NAAQS are predicted by the SAI study to be exceeded due to direct emissions from oil shale facilities.

The discrepancies between modeling results are not easily rectified, due to varying assumptions and approaches used by the workers. However, the results can be evaluated for reasonableness. When this is done, a number of concerns about the model used in the Draft EIS become apparent:

- A. Wind Field Modeling - This is critical to the overall results, since the major factor governing dispersion of the individual plumes is horizontal transport by the winds. Both the interaction between plumes and points of maximum concentration are determined primarily by the wind flow pattern. Consequently, The WINDS model used in this analysis deserves

close scrutiny. Unfortunately, the output from WINDS is entirely a set of wind vectors predicted by the model - no actual monitored wind data is used in the model. The model calculates the wind field in two steps:

- a) adjusting the background wind (which is arbitrarily defined) to account for major terrain features
- b) modifying the wind field to account for perturbations caused by the actual terrain and thermal and frictional factors.

This is accomplished by using simplified theoretical approaches.

A major concern with the theoretical approach used in the WINDS model is that steady state conditions are assumed (Dietrich, 1981). That is, the flow field is assumed to be invariant with time. This approach ignores the diurnal variation which is a significant factor in boundary layer flows in complex terrain. A complete reversal of flow direction (and hence greatly increased plume dispersion) is often observed in complex terrain. Consequently, the steady state conditions assumed by the model are not likely to occur (especially under the atmospheric conditions assumed here: 4 m/sec wind at 10 meters and "E" stability), thus the 24-hr predicted impacts appear to be unrealistically overpredicted.

(33)
(144)

This model, then, develops an abstract wind field based upon theoretical principles which is used to estimate air quality impacts, without ever being validated in the Piceance Basin. The model did undergo preliminary validation in San Diego County in California. However, this model validation was carried out using only one data point per day (at 1 pm), and thus completely missed the important diurnal effects discussed above. We feel that it is inappropriate to compute worst case 24-hour impacts in the Piceance Basin with a steady state model that has been only partially validated in another part of the country using a very restricted data set.

Even under long-term conditions, however, the state of the art modeling is such that the complex terrain in the Piceance Basin may easily cause major differences between theoretical principles and actual wind flows. At an American Meteorological Society Conference on Mountain Meteorology in 1981, it was generally agreed that the scientific understanding of the problem of flow in complex terrain was poorly understood, partly because of a severe lack of data. As an example, one investigator studying nocturnal flows near Tract C-a (Barr and Clements, 1981) found an unexpected easterly flow embedded in a generally westerly flow pattern. This easterly flow, located within 100 meters of the surface, would completely invalidate any air quality dispersion modeling, since it is unaccounted for in current models. The authors state that this "... offers a warning about postulating air quality projections without an adequate basis of measurements".

If the wind field flow patterns in the air quality technical report (Figures 2-6 through 2-10, Dietrich et al., 1982) are closely examined, the cause of the abnormally high air quality impacts near Rifle become apparent. Particularly under conditions of WSW, W, and NW background winds, an area of convergence of winds from all directions occurs just west of Rifle. Consequently, the model predicts very high air quality impacts due to this anticipated zone of convergence. Other areas (such as Craig), which do not have a zone of convergence, have predicted air quality impacts at least an order of magnitude less than the impacts at Rifle. It should be emphasized that this zone of convergence has not been measured, only predicted by the air quality modeling. In fact, it is highly unlikely that this zone of convergence is a steady state condition that is maintained 24 hours per day as assumed by the model. Until this phenomenon has been verified, the modeling results must be highly suspect.

- B. Reasonableness of Results - Evaluation of the modeling results reveals another peculiarity: under a "northwest influencing" wind, the wind field modeling shows that pollution from the C-11 and C-18 leases would be transported directly toward Rifle, yet there is no increase in air quality impact between the No Action Alternative and the Year 2003 High

Scenario. This is predicted despite a production increase from the No Action Alternative of 379,000 bbl/day to the 2003 High Scenario of 819,000 bbl/day, an increase of 70 percent. Since the increased production (and emissions) all occur near the C-11 and C-18 leases and the WINDS model predicts that the emissions will be transported directly towards Rifle, how can there be no additional impact? Where does the pollution go? Apparently, the zone of convergence just west of Rifle prevents any impact at Rifle from the additional 340,000 bbl/day of production. These results simply do not seem to be realistic. The model must be verified and validated before these results can be relied upon.

(33)
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C. Confidence In The Results - The recent air quality impact analysis done for the Uinta Basin (SAI, 1982) presented ranges for predicted air quality impacts. This seems to be a reasonable approach, given general agreement that air quality modeling is accurate within a factor of two in flat terrain, and probably much less in complex terrain. Why then does this air quality analysis present results to four and five significant figures? Apparently, the authors have not carefully evaluated their work and tested it for reasonableness.

(82)

D. Stability Class - In the report, the impacts are determined for the 24-hour standards and increments, since these are expected to be continuing. It seems unrealistic to assume an "E" stability for 24 hours, especially since the Uinta Basin study (SAI, 1982) assumed a "D" stability.

(80)

E. Visibility - The air quality analysis includes a Level-1 visibility analysis. The problem is that a Level-1 analysis is inadequate as a diagnostic tool for predicting visibility impacts. It is designed only as a simple, quick screening tool to eliminate those sources that obviously will not cause visibility impacts. A Level-1 analysis does not provide sufficient information for decisions to be made on this EIS.

More importantly, predictive visibility modeling has been shown to be very inaccurate. The American Petroleum Institute recently funded ERT

(140)

to do an evaluation of visibility models. (ERT, 1982), which showed that present methods yield predictions that are essentially unrelated to measured values. This study also showed that two commonly used methods yield visibility predictions that differ by a factor of 4 or more.

F. Atmospheric Deposition - The EIS presents predicted deposition values, yet no screening or analytical model has yet been suggested by EPA, let alone verified. In addition, the predictions are presented with no interpretation or reference values in order to provide some means of attaching significance to the estimates. The values presented here are approximately the same as given in the Uinta Basin study (SAI, 1982), which concluded that the effects would likely be minimal.

(7)

G. Increment Consumption at the Flat Tops and Mt. Zirkel - The modeling parameters assumed for this study include a 4 m/sec background wind at 10 meters and "E" stability for 24 hours. This choice of "E" stability, as indicated above, is too conservative - a "D" stability choice would be more realistic, especially over a 24-hour period. However, if "E" stability is chosen, then the wind field diagrams appear to be in error (Figures 2-6 through 2-10). Specifically, under light winds and stable atmospheric conditions ("E" stability), typical of nocturnal drainage conditions, there should be a relatively deep easterly wind flowing down from the Flat Tops and Mt. Zirkel area to the Piceance Basin. Consequently, the plumes from oil shale facilities would probably never reach the wilderness areas under "E" stability conditions. The points to be made here are:

(80)

1) The actual regional wind field could differ by 180° at some locations (see Barr and Clements, 1982) from simplified theoretical calculations. There is virtually no data to verify or reject almost any wind field prediction that might be made.

2) Given these uncertainties, there is no justification in providing calculations of increment consumptions to three significant digits - the results may easily be off by an order of magnitude. A set of error bounds would be more reasonable (SAI, 1982).

(82)

- 3) The selection of atmospheric stability is too conservative.

Summary on Air Quality Analyses

One of the major concerns, which will have a significant effect on the impact analysis, is the wind field modeling. As discussed above, there are at least two locations where the results are highly suspect. There is no discussion of the reasonableness of the results, nor of tests to determine the sensitivity of the model to changes in input parameters, i.e., changes in the grid size used in the model. The zone of convergence predicted near Rifle is the apparent cause of the extremely high concentrations estimated there, yet no monitored data or validation techniques have been used or are available to prove that this analysis is more accurate than others which have not shown this impact. Based on these uncertainties, providing what appear to be very significant and accurate results on the basis of unvalidated prediction techniques is highly misleading and inappropriate for inclusion in an EIS.

HYDROLOGY

The uncertainties of modeling the complex hydrologic systems in the Piceance Basin need to be addressed in more detail in the DEIS. The models employed are largely invalidated and little use is made of existing data, such as on current mine dewatering operations. The need exists to deal with model uncertainties in a manner to provide a realistic perspective for interpretation and decision making.

A. Groundwater

1. The EIS indicates that the hydraulic heads of upper and lower aquifer are nearly equal at C-11 and C-18. In another location, the EIS indicates that flow is from lower to upper aquifer through the Mahogany Zone. This apparent inconsistency should be clarified as it is key to site-specific ground water impacts such as aquifer mixing.

(2)

2. The plot of groundwater levels during operation (dewatering) shows flow potential from upper to lower aquifer. Thus impacts on the relatively good quality water in the upper aquifer would not be expected during operation. }
3. For the effects of dewatering, it would be better to draw on the experience of actual operations at Tract C-a and C-b than on Taylor's model. The grid size of this regional model is inadequate for site specific analysis such as dewatering at the proposed new lease tracts. } (135)
4. Page 134 includes projections of TDS changes due to dewatering on Tract C-b. Since dewatering has occurred on Tract C-b (and Tract C-a), actual data should be compared to the model projections in order to validate the model results. Without such validation the model results cannot be substantiated. } (221)

B. Surface Water

1. Page 133 indicates increased channel erosion and degradation as evidenced on Tracts C-a and C-b. The extent and nature of this "degradation" should be more explicitly substantiated (i.e. data need to be presented). } (2)
2. Page 137 (surface water quality - no action alternative) references Table III - 10 as showing impacts on surface water. This should be Table IV - 10, as Table III - 10 deals with employment and income. } (6)
3. The EIS describes impacts on Yellow Creek which may become dry over 50 percent of the time. Sections of Yellow Creek are now dry at times. The water near the confluence with the White River is saline (conductivity 3000-4000 micromhos/cm) with very limited aquatic habitat and no fishery. The impacts of development on such a system are unclear. } (155)

4. The rationale for selecting 1951 as a period of "normal" flow (pg 137) needs to be presented. Normal is usually defined in a statistical manner. Also the backup data for projected water use on Tract C-a is needed. The listed use projection (6K acre-ft in 1988, 8K acre-ft in 1993 and 16K acre-ft after 2000) is probably inappropriate.

(199)
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5. On page 137, flow reductions in the White River are labeled as "insignificant". The following sentence: "However this water would be lost for other uses, such as agriculture." is similarly insignificant and should be deleted.
6. Projected flow reduction are based on total water supply (4 bbl/bbl oil) from the White River. The mine dewatering analysis does not include reinjection or discharge (the water is gone from the system). Pumped groundwater will be used or discharged, either of which would reduce depletion. The facility water balance presented in the EIS may be misleading.
7. Page 137 indicates that most stream depletions will occur in the initial years. It should be noted that during the initial segment of site development, dewatering operations will likely produce a surplus over consumptive needs. Thus depletions (and related quality changes) are not likely to be as great as projected.

(2)

C. Spent Shale Disposal

1. The evaluation of impacts of surface processed shale piles cannot be accomplished without due consideration to rates of leachate production. Test plots of soil, over spent shale on Tract C-a indicate water penetration of only about 70 cm. The plot has produced no leachate over the 7-year study period.
2. The utility of the analysis by Robson and Saulnier (1981) to discuss impacts is unclear. The report deals with potential effects of in situ spent shale leaching at Tracts C-a and C-b.

(151)

Although C-a has not abandoned this approach entirely, it is not the current primary approach due to potential for enhanced resource recovery from open pit mining with surface retorting.

MISCELLANEOUS

1. Threatened and endangered species - The reference made to whooping cranes and peregrine falcons relates to sightings during baseline studies on Tract C-a. During these studies, incidental sightings of one whooping crane with greater sandhill cranes and one peregrine falcon occurred. These individuals were apparently migrating in the vicinity of Tract C-a. Rio Blanco evaluations show that this area does not provide critical habitat for any state or federally endangered species.
2. It is not clear that in situ retorts will be governed under the UIC program as indicated on page 134. It is also unclear how additional groundwater data will assist in determining "how these new regulations will affect groundwater systems of Piceance Basin". Regulations do not affect natural systems at all. (2)
3. The discussion of construction impacts should include a statement that erosion/sediment control structures are required. Thus a greatly increased loading is not anticipated. (155)
4. The discussion of process water is incomplete. The fact that it will be produced and that it contains inorganic and organic constituents does not lead to potential impacts. Water treatment and reuse needs to be discussed. (2)

ENVIRONMENTAL STIPULATIONS

1. Stipulation of drainage and collection system below piles. As such systems will always fail in some time frame without continuing maintenance. Since continuing maintenance ad infinitum is infeasible, this (19)

stipulation is not reasonable nor is such a design likely to be approved by the Colorado Mine Land Reclamation Board.

2. In a somewhat similar fashion, the stipulation for lined impoundments is only applicable to operational phases and is not feasible for the longer term. (100)

3. Deep aquifer wells are inappropriate for monitoring of surface disposal piles and surface impoundments in this area. A realistic anticipation is for long term, low level releases from surface disposal piles. The time frame to reach deep aquifers, penetrating the pile, several hundred feet of Uinta Formation and confining beds of artesian aquifers, make deep aquifer wells most inadequate for monitoring. The time to response at monitoring sites is too long and too uncertain and the likelihood of mitigation at that time is small. (222)

The more appropriate monitoring should be focused within and adjacent to the pile and perhaps adjacent alluvial systems.

Deep wells are more appropriate for monitoring effects of mining or in situ development.

REFERENCES

Dietrich, D. L., 1981: Wind Climatology in Complex Terrain, Ph.D. thesis, Department of Earth Resources, Colorado State University, Fort Collins, Colorado.

Dietrich, D. L., D. G. Fox, M. C. Wood, and W. E. Marlatt, 1982: Air Quality Impact Assessment for the Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Progra, prepared for Bureau of Land Management, Denver, Colorado.

Barr, S. and W. E. Clements, 1981: Nocturnal Wind Characteristics in High Terrain of the Piceance Basin, Colorado, in Second Conference on Mountain Meteorology, November 1981, American Meteorological Society.

ERT, 1982: Evaluation and Application of Visibility Models for PSD Impact Assessment of Two Conceptual Synthetic Fuel Production Plants, Concord, Mass.

SAI, 1982: Air Quality Impact Analysis of Synthetic Fuel Development in the Uinta Basin, Final Report, to Bureau of Land Management, Salt Lake City, Utah.



United States Department of the Interior

GEOLOGICAL SURVEY

P. O. BOX 810

321 7TH STREET

MEEKER, COLORADO 81641

PHONE:

303 - 878 - 5086

WATER RESOURCES DIVISION

MEEKER SUBDISTRICT

September 21, 1982

Memorandum

To: John Singlaub, Bureau of Land Management, Meeker, Co.

Via: Subdistrict Chief, U.S. Geological Survey, WRD,
Meeker, Co. *WJS*

From: Frank Welder, U.S. Geological Survey, WRD, Meeker, Co.

Subject: Comments on Supplemental Environmental Impact
Statement for the Prototype Oil Shale Leasing
Program 1982

On page 39 is the statement that "as a result of mine dewatering Yellow Creek will become dry over 50 percent of the year. Also Piceance Creek would experience periods of no flow in the summer." This opinion is based on earlier assumptions that ground water in the bedrock aquifers (Uinta and Green River Formations) is, throughout the basin, directly connected to the valley-fill material in Piceance and Yellow Creeks, to the flow in the creek channels, and to the springs in the creek valleys. Unfortunately these assumptions have not been verified except at the extreme upper and lower reaches of the two creeks.

Our most recent study of the hydrologic relationship between the bedrock aquifers and the valley-fill material, springs, and creek channels, has been in the valley of Yellow Creek in sections 1 and 2, T.1S., R.98W. where a large spring flows about 250 gallons per minute from the western edge of the valley. We drilled six test holes through the valley-fill material. Due to a shortage in funding, we have not completed the site study, but geologic evidence from other locations in the basin indicate that some springs flow from the valley-fill material and not from the bedrock aquifers. Thus dewatering the bedrock aquifers in these areas may have little if any effect on ground water in the valley-fill material, on the flow from the spring or the flow in the channel.

(251)

John Singlaub

2

We have geologic evidence that these conditions exist in both Yellow and Piceance Creeks. We would like to pursue this further. The legal and technical implications are clear and very significant.

Frank Welder

Frank Welder

Copy to: Tom Major, WRD, Lakewood
O.J. Taylor, WRD, Lakewood
Bill Van Liew, WRD, Meeker
District Chief, WRD, Lakewood

American Petroleum Institute
2101 L Street, Northwest
Washington, D.C. 20037
202-457-7000



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BUREAU OF LAND MANAGEMENT
WHITE RIVER
MEEKER, COLORADO

September 21, 1982

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Area Clerk			
Clerk			
File			

Mr. John Singlaub
EIS Team Leader, White
River Resource Area.
U.S. Bureau of Land Management
P. O. Box 928
Meeker, CO 81641

Dear Sir:

The American Mining Congress and the American Petroleum Institute, through their respective Synthetic Fuels Committees, appreciate the opportunity to comment on the Draft Supplemental Environmental Impact Statement (DEIS) for the Prototype Oil Shale Leasing Program (47 FR 31080, July 16, 1982).

The purpose of the DEIS as we understand it is to examine the site specific and potential cumulative impacts of leasing up to two additional prototype tracts under the original 1973 Prototype Oil Shale Leasing Program. While there are numerous comments that could be made if time permitted, we believe that DEIS is seriously deficient in at least three areas: air quality, hydrology and socioeconomics.

Additionally, it is our understanding that the EIS for the long-term Oil Shale Leasing Program is being prepared concurrently with the subject EIS and that the Programmatic EIS will use much of the same baseline information and assumptions as the prototype supplemental EIS. It is our concern for both programs that prompts our overview comments. We expect that individual companies will submit more detailed comments.

Air Quality

The analysis in this section is based upon unrealistic assumptions and unvalidated models, which results in erroneous conclusions. For instance, the assumption of wind persistence in a given direction for 24 hours is extremely conservative and not representative of available data. We would be pleased to assist in obtaining technical assistance from industry specialists in order to establish a more realistic assessment of air quality impacts.

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Mr. John Singlaub
 September 21, 1982
 Page Two

The DEIS concludes that serious air quality violations would occur in the baseline or "No Action Alternative" which includes all of the development and land uses reasonably anticipated for the region in the foreseeable future but not additional federal leasing. Since development levels will be controlled by the PSD permitting process, this implies that the responsible agencies, EPA and Colorado Department of Health, would issue permits that would result in violations of the NAAQS and PSD increment limits. This presumption ignores the fact that, by law, developers must comply with applicable standards. Thus if permit agencies used the same unvalidated models and emissions estimates, they would not permit the capacity projected in the No Action Alternative.

(1)

Hydrology

The hydrologic system of the Piceance Creek Structural Basin is very complex. The DEIS treats this system in a highly qualitative manner despite the availability of a large amount of quantitative information that was not used, e.g., information contained in numerous U.S.G.S. publications. There are numerous contradictory qualitative comments that are not supported by the information given. There are frequent instances where the limited amount of quantitative information given is inconsistent. Frequently the hydrology discussion would benefit from the inclusion of diagrams, tables, and maps that are less vague than those used. The hydrology discussion appears in several places rather than all in one place which probably contributes to the consistency problem.

Socioeconomics

The discussion in the DEIS with regard to socioeconomic concerns is superficial. There should be specific discussions and inventories of community needs, both collective and individual.

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On page 10 of the summary a statement is made to the effect that the key to the impact predictions presented is the actual growth (baseline conditions) which will take place in the absence of additional leasing. It is recognized in the statement that conditions in the area have changed markedly since the analysis of socioeconomic impacts was made. The baseline projections used in the analysis contain key assumptions of rapid and large-scale oil shale development. As we are all aware, during the past year many of the large projects on the Western Slope have either been delayed or indefinitely postponed. It now appears likely that development will occur at a more reduced level and spread over a longer period of time. Because the accuracy of the baseline is critical to the reasonableness of the impacts predicted, the impact assessment as currently presented must be

(4)

Mr. John Singlaub
September 21, 1982
Page Three

considered invalid. The findings, if used in the decision-making process as intended, may lead to incorrect assumptions and ultimately less than optimal decisions concerning leasing policies.

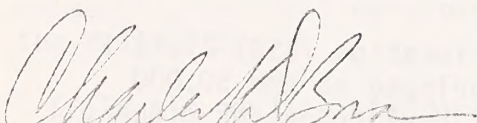
The analysis is further weakened by the fact that it is incomplete. There is no analysis or discussion, for example, of existing and projected jurisdictional infrastructure requirements and impacts (e.g., schools, water systems, law enforcement) or of the existing fiscal conditions and subsequent fiscal impacts of the proposed action.

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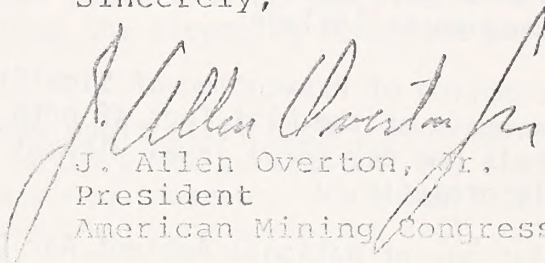
Finally, there is a noticeable absence of discussion of key assumptions and methodological procedures.

We appreciate the opportunity to comment and the efforts of the federal government to establish a viable oil shale leasing program. If you have any questions, please contact Bruce L. Petersen, API (202/457-6690) or Mary Jane Due, AMC (202/861-2860).

Sincerely,



Charles J. DiBona
President
American Petroleum Institute



J. Allen Overton, Jr.
President
American Mining Congress



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

1860 LINCOLN STREET

DENVER, COLORADO 80295-0699

OCT 7 1982

Ref: 8PM-EA

Mr. George C. Francis
State Director
Bureau of Land Management
Colorado State Office
1037 20th Street
Denver, CO 80202

Dear Mr. Francis:

We have reviewed the draft supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program and wish to offer the following comments for your consideration. First, we would like to compliment your agency for clearly and forthrightly addressing the issues discussed in this well-prepared EIS. The concerns outlined in our comments stem from the environmental effects of the actions described in the EIS.

The draft supplemental EIS contains sufficient information to analyze the key environmental consequences of the proposed action. As stated in the EIS, these consequences include:

1. Consumption of Prevention of Significant Deterioration (PSD) Class I increments at the Flat Tops if both tracts developed at the 50,000 barrels per day (BPD) level without concurrent development of other oil shale projects.
2. Violations of National Ambient Air Quality Standards (NAAQS) and consumption of PSD Class II increments near Rifle and PSD Class I increments at Flat Tops and Mt. Zirkel if development of the tracts proceeds concurrently with other proposed oil shale projects.
3. Serious adverse surface and subsurface water quality impacts due to the location of the tracts within the Yellow Creek and Piceance Creek basins due to the anticipated effects of leaching through flooded in-situ retorts or mines and aquifer mixing. The contaminants which are most likely to increase are pH, sulfates, sodium, hydrogen carbonate, and certain organic compounds. These contaminants pose environmental, public health and economic concerns.

Based on the air and water quality impacts described in the EIS, it appears that development of both of the proposed tracts (C-11 and C-18) has the potential for causing significant adverse environmental impacts. BLM should be aware of the trade-offs (as enumerated in our detailed comments) involved in a decision to lease the tracts. We would recommend that further work be done to clarify the results of the analysis done for the draft supplemental EIS.

2-

We believe that refinements in the air quality analysis and further consideration of groundwater conditions are needed to confirm the predictions of the EIS and identify mitigative measures that might allow development to proceed. If the studies recommended below are completed in time to be included in the final EIS, we believe the basis for a definitive decision on the proposed leases would be strengthened.

First, with respect to air quality, some of the assumptions made in evaluating the air quality impacts are incorrect. Projected development under the no action alternative should be evaluated under existing regulatory requirements. Current provisions in the Clean Air Act require that each project demonstrate compliance with applicable standards and regulations before development proceeds. Under PSD and new source review program requirements, air quality analyses are performed which ultimately determine whether or not the impacts of specific oil shale projects would exceed NAAQS and PSD increments. The air quality analysis for the EIS errs by assuming projects that could not meet air quality requirements would nonetheless proceed to development and contribute to background air quality conditions. While correction of this assumption would presumably reduce the background levels against which development of tracts C-11 and C-18 would occur, the model would have to be run again to determine whether air quality standards could be met. The accuracy of the model would also be improved if actual meteorological data were used rather than the screening technique employed in the draft EIS.

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If air quality standards violations would still occur, your agency may wish to consider several options that could allow substantial oil shale development and still maintain clean air requirements. We suggest that the final EIS evaluate options such as, requiring more stringent BACT, obtain offsets from permitted facilities, retrofitting existing plants, or obtaining a variance under Section 165(d) of the Clean Air Act. These options are discussed in more detail in a recent EPA report entitled "Evaluation of Alternative Prevention of Significant Deterioration Policies, A Case Study of Oil Shale Development in Colorado and Utah," April 1982 (copy enclosed).

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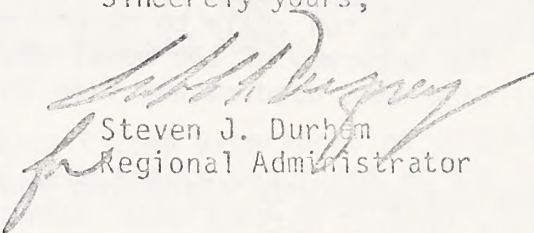
As to the adverse water quality problems identified in the EIS, we agree with your conclusion that the location of the two tracts is one of the most difficult places in the Piceance Basin in terms of water impacts. The most promising mitigation measures from an economic standpoint appears to be careful site selection and planning to minimize the impact of mining activities on groundwater regimes. Although tract C-18 appears somewhat better suited for development than C-11 because of its reduced potential for impact on groundwater discharge, there is still a potential for serious water quality problems in surface and subsurface waters regardless of the shale recovery technique that is used. Other suggested mitigative measures such as grouting or filling of the mined area with insoluble material, backflooding of underground retorts or leaching of spent shale prior to disposal do not appear economically feasible.

-3-

In summary, the expected air quality standards violations and water quality impacts of leasing and development of tracts C-11 and C-18 require us to rate this EIS EU-1. (The proposed full development of both tracts would be unsatisfactory from the standpoint of public health and welfare and environmental quality.) If the decision is made to lease both tracts, we would recommend that further studies be undertaken and/or mitigative measures proposed which would ensure compliance with environmental standards. If only one of the tracts is offered for development and further analyses indicate air quality standards can be maintained and water quality impacts can be mitigated we would rate the single-lease option in the category of Environmental Reservations (ER-1). Because of the smaller number of springs and alluvial valley areas and the better reclamation potential of tract C-18, we consider it to be the environmentally preferred alternative among the two tracts considered in the EIS.

We appreciate the opportunity to review this well prepared EIS. Attached are additional detailed comments on the air and water quality aspects of this proposed action. Please contact Gary Voerman of my staff at (303) 837-4831 if we can be of further assistance in this matter.

Sincerely yours,



Steven J. Durham
Regional Administrator

Enclosures

Detailed Comments
prepared by
The U. S. Environmental Protection Agency
on the
Draft Supplemental EIS for the
Prototype Oil Shale Leasing Program

Air Quality:

The approach taken for evaluating the air quality impacts of the alternatives is incorrect. The document assumes that National Ambient Air Quality Standards (NAAQS) violations and Prevention of Significant Deterioration (PSD) increment consumption for both Class I and Class II increments in various locations will have already occurred due to other potential developments in the region of air quality impact.

Instead of assuming these conditions, the projected development under the no action alternative should be evaluated under the existing regulatory requirements. This requires the assumption that a project would not receive a permit and therefore would not be built if it could not meet the existing requirements. Under the leasing alternative the document should show the necessary steps for development within the allowable air quality limitations. This approach should look at constraints on the ultimate size of the lease development or on alternatives such as offsets from other facilities.

One cannot at this time presume that there will be significant changes in the Prevention Significant Deterioration Regulations or in any of the ambient air quality limits except particulates. Since the particulate standard revision has not yet been proposed, a conservative approach should be taken to evaluate particulate impacts.

A technical review and analysis of the emissions inventory on page 111, shows no relationship between the emission rates estimated and the existing regulatory limitations. For projecting these emission estimates one should assume that the source is operating at 100% of capacity and emitting at the legal limit.

In the Air Quality Analysis the Topographic Air Pollution Analysis System (TAPAS) models were used. These models are considered nonguideline and with the information provided, a determination can not be made on the adequacy of their use. In order for an analysis of the modeling to be done, a complete description of the model and its inputs is necessary, and should include as a minimum, the dispersion scheme, the meteorological data used, how worst case conditions were assumed, how terrain is accounted for, how plume height is determined, whether/how deposition is accounted for, and the chemical conversion rate used by NO to NO₂. The worst case conditions modeled were E stability with a 4 meters per second westerly wind. EPA uses F stability and 2.5 meters per second as worst case conditions for screening purposes. If these conditions were used here, the modeled concentrations would be larger than those obtained. Real meteorological data should be used instead of the screening method considering the results obtained.

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Groundwater:

Lease sites further away from the Piceance Creek than C-11 and C-18 would be desirable because of the upward movement of groundwater from the Green River Formation through the Mahogany zone and other oil shale zones to Piceance Creek. The closer the mining operation is to the creek, the greater the potential for interfering with the creek's recharge mechanism.

C-18 is preferable to C-11 as far as groundwater impact is concerned for the following reasons:

- A) C-18 is further from Piceance Creek and thus would have less impact on the groundwater recharge mechanism for the creek.
- B) C-18 has fewer springs and seeps which would have to be avoided in placement of spent oil shale if leachate production is to be kept at a minimum.
- C) C-18 has a fewer alluvial valleys which could be impacted.
- D) C-18 has a better landscape (few steep slopes) for sedimentation ponds and ponds will be needed for mining de-watering operations.

One potential adverse impact on groundwater not evaluated in the EIS concerns the effects of subsidence. If saline minerals are recovered by steam injection, then the resultant subsidence could substantially alter the flow condition. This problem should be evaluated in the final EIS.

(250)

Surface Water Quality:

1. The EIS should focus on the impacts of four prototype leases (two existing and two proposed) on the White River drainage. The cumulative impacts on Piceance Creek, Yellow Creek, and the White River need to be expanded. The discussions should include water quality parameters such as fluoride, boron and phenols which are known to have caused water quality violations when mine discharge water was released from Tract C-b.
2. The EIS should also examine the performance history of the existing lease tracts U-a and U-b. The hydrological problems associated with these projects, such as reinjection performance, should be discussed and evaluated. Mitigation of surface and groundwater quality impacts should recognize the existing surface discharges at U-a and U-b and how these would relate to surface development of Tracts C-11 and C-18.
3. The EIS should stress the utilization of environmental lessons learned in the development of Tracts U-a and U-b in planning for future prototype leasing. Future mitigation plans should be based on a realistic evaluation of the performance of existing operations.

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1 UNITED STATES DEPARTMENT OF THE INTERIOR

2 BUREAU OF LAND MANAGEMENT

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8
9 PUBLIC MEETING ON THE

10 DRAFT SUPPLEMENTAL

11 ENVIRONMENTAL IMPACT STATEMENT

12 FOR THE

13 PROTOTYPE OIL SHALE LEASING PROGRAM

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21 Stetson Room
Ramada Inn Foothills
6th Avenue and Simms
22 Lakewood, Colorado

23 Tuesday,
24 August 24, 1982
25

I N D E X

SPEAKERS:

PAGE NO.

Lillian Valenzuela - University of Colorado	14
Hester McNulty - League of Women Voters of Colorado	17
Anne Vickery - Colorado Mountain Club and Wilderness Society	19
Pauline Plaza - National Audubon Society	24
Bob Yonkey - Regional Counsel, Environmental Defense Fund	26
Kevin Markey - Friends of the Earth	32
Norm Mullen - Colorado Open Space Council and Colorado Wilderness Network	36

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1 UNIDENTIFIED SPEAKER: We'll waive.

2 MR. SMITH: Okay; Tom waived. D. W. Lewis.

3 Mr. Lewis?

4 (Pause.)

5 MR. SMITH: Well, he was representing Mobil Oil. How
6 about C. S. Howser with Mobil Oil?

7 UNIDENTIFIED SPEAKER: We'll waive it.

8 MR. SMITH: You'll waive? Okay. Lillian Valenzuela?
9 If you would come up here, please?

10 UNIDENTIFIED SPEAKER: Who do you represent?

11 MS. VALENZUELA: I'm with -- well, I've followed this
12 for a while. I'm with CU and I'm in environmental conservation.

13 I have noticed that people tend to talk a lot about --
14 would be willing to explain things that they know a lot about,
15 but tend to, regarding the unknown, tell us not to worry and I
16 just want to point out some of the unknowns that I've noticed
17 in previous environmental studies, particularly in that Basin,
18 that haven't been addressed quite as deeply as they should have
19 been.

20 The groundwater studies, it looks like they are being
21 dealt with more thoroughly in this draft.

22 I think there's a problem with funding. I know that
23 the Soil Conservation Service in the Piceance Creek Basin has
24 been trying to get extensive studies done and the kind of
25 specific information that they need. They need a great deal of

1 more support from the State and from courts -- studies that are
2 particularly directed at environmental information. Right now
3 they pretty much have to follow the companies who have already
4 drilled wells around and get the information.

5 The other issue is subsidence. That's dealt with in
6 areas where other mining is to be done, dealt with on the long
7 term. I think also issues that might be considered are the
8 amounts of groundwater disturbance and subsidence that is going
9 to result in groundwater -- the dewatering process in the mine,
10 and this can cause structural instability at reservoir sites,
11 cause grade-slope disturbance and the additional weight of all
12 the shale piles, the disposal piles is a factor that needs to be
13 considered.

14 The problem with heat or the heat pollution problems
15 I don't see dealt with generally from a -- well, Colony was going
16 to cool something like 2700 to 3,000 tons of shale, heated shale
17 at 900 degrees for an hour -- hours -- and it's rather staggering
18 to see that much coming through and being disposed of and having
19 other drains to which streams are passing through, and to have
20 the deal with the heat pollution that would occur in the streams,
21 the damage to wildlife, fish.

22 The other issue I don't see dealt with at all is the
23 effects of the hydro-fracturing techniques that have been
24 conducted in the Basin, their effects on groundwater and the
25 mixing of the aquifers, particularly the 1973 Rio Blanco Nuclear

1 Project which was held particularly in the site of the new lease
2 site C-11, which is 2 South 97 West.

3 The reason they did the gas-stimulation project in
4 1973 was to release a huge store of gas at that very site.
5 Ben Wiseman did a study back then that showed that there might
6 have been structural damage in the area of his lease tract, the
7 Multi Mineral site, and I don't see much follow-up on that.
8 That could have implications for mining safety and groundwater
9 and that gas was to be released under extremely high heat, high
10 temperatures, it was vaporized. There was some problems with
11 the core hole that was drilled that was damaged that could have
12 connected with the aquifers and whatever radiological effects
13 may have been present, but also structural damage to the aquifers
14 and to the rock structure.

15 The damage at present, the USGS -- that has been done
16 by the present site has not been thoroughly reviewed, I think.
17 The USGS records show that there has been a steady increase in
18 sedimentation deposits since 1977, 1977 through 1980, an extreme
19 rise in sedimentation load in the streams. And some of this is
20 expected. There was a rise of some 270,000 tons per day on
21 September 7th of 1977. This is an interesting figure.

22 So I think the present damage should be thoroughly
23 evaluated for the sites that are now operating, even though they
24 are not at a commercial stage. Thank you.

25 MR. SMITH: Thank you. Hester McNulty?

(D)

MS. McNULTY: I am Hester McNulty speaking for the League of Women Voters of Colorado. Some of our 23 local Leagues are in the region which would be affected by additional prototype leases and they will address their specific local concerns at the Grand Junction meeting.

First, the League compliments you for the preparation of a good Environmental Impact Statement. It's readable, concise, delineates the major issues and analyzes alternatives. We also think, in most cases, the probable impacts are assessed correctly, within the limits of existing data.

We have found, however, that there is more recent information on the quality of raw shale lechates than was used in the preparation of the EIS. Laboratory studies have indicated that particular emphasis should be placed on aluminum, boron, fluoride and zinc, as well as molybdenum in Mahanogany mined shales. This study also recommended that sulfur species in lechate should be determined. I believe some of that work has been done, has been carried on at CSU. We believe the EIS should more adequately address the runoff and lechate from raw shale piles.

The League's preference is for the No Action Alternative. We have chosen this alternative because the EIS indicates that even without additional prototype leases, the region could be subject to serious air quality problems and in some cases violate health standards. Moreover, air quality in wilderness and

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1 recreation areas would be threatened. Leasing should be post-
2 poned until technology either eliminates or substantially
3 reduces emissions from oil shale projects.

4 However, if the decision is made to lease, it should
5 be consistent with the original goals of the Prototype Oil Shale
6 Leasing Program which were to test the technical, economic and
7 environmental feasibility of differing oil shale technologies.
8 Production should be limited to 10,000 barrels per day until
9 the technology is proven, the economic feasibility is established
10 and the environmental data is analyzed. Because both tracts
11 would demonstrate the same multi-mineral technology, leasing
12 should be limited to one tract.

13 After eight years of the prototype program, no
14 technologies have yet been tested. This fact and recent events
15 on private lands should indicate that for the prototype program
16 to fulfill its original purpose, a 100,000 barrel per day limit
17 is desirable. New technology for emissions control could be
18 also developed so that if a larger operation proved to be
19 feasible, the impact on air quality would be reduced or
20 eliminated.

21 If the decision is made to lease, Tract C-18 was
22 judged to have less severe impacts than Tract C-11 and is
23 therefore preferable. And, if a lease is granted, the environ-
24 mental stipulation should clarify that state environmental
25 regulations and standards, which are more stringent than either

1 federal regulations or law, will be complied with. We believe
2 this is necessary because EPA is in the process of issuing we
3 regulations for environmental programs and there is a possibility
4 that new federal legislation will not protect Colorado's
5 resources. The question of primacy could arise.

6 We also think the state should be a party to those
7 decisions in the environmental stipulations which are left to
8 the discretion of the mining supervisor. Examples are additional
9 air, surface water and groundwater monitoring requirements, the
10 use of pesticides, and clean-up of hazardous or oil spills.

11 Finally, if the lease is to prove the feasibility of
12 multi-mineral processing, then the leasing must require -- the
13 lease must require the processing and economic recovery of
14 nahcolite and dawsonite. This stipulation must be added or any
15 reason for the lease will be invalidated. Thank you.

16 MR. SINGLAUB: Thank you.

17 MR. SMITH: Anne Vickery?

18 MS. VICKERY: My name is Anne Vickery. I'm speaking
19 today for the Colorado Mountain Club and for the Wilderness
20 Society. The Colorado Mountain Club is a state-wide recreation
21 and conservation organization with over 7,300 members. The Club
22 takes backpacking, hiking, climbing, camping and skiing trips,
23 open to the public, into the Colorado high country, including
24 the wilderness areas. The Wilderness Society is a nation-wide
25 non-profit organization with 50,000 members dedicated to the

1 preservation of wilderness and other public lands.

2 BLM is to be complimented for a straight-forward draft
3 EIS that clearly describes impacts. This type of document makes
4 the public comment process much easier to participate in.

5 Members of the Mountain Club and the Wilderness Society
6 have been alarmed to read in the Draft that even with the "No
7 Action Alternative" there will be a violation of the SO₂
8 standards in the Mt. Zirkel Wilderness. Given this situation,
9 we are even more concerned that if both proposed tracts, C-11
10 and C-18, are leased, there will also be a violation of the SO₂
11 standards in the Flattops Wilderness. This creates an incon-
12 sistency which must be resolved. The lessees are required to
13 conduct operations in conformance with all applicable federal,
14 state and local laws. This is impossible if the federal
15 standards PSD increments will be violated.

16 Both the Mountain Club and the Wilderness Society will
17 be turning in written comments, but I'd like to make a few
18 points where the Final should more clearly address the air
19 quality issues.

20 One, the baseline for the No Action Alternative should
21 be clearly spelled out. The Hayden Power Plant and the Utah Oil
22 Shale operations should be included.

23 It is also very important that the air pollution from
24 secondary, tertiary and associated sources, however these are
25 defined, be included in the baseline and in each alternative.

(D) 21
1 The paragraph on page 18 says too little is known about these
2 sources to analyze them. However, these sources may be the ones
3 causing the most problems and these sources are as much a part
4 of oil shale as the retorts. The prototype program should be
5 analyzing impacts from all related sources. The bottom line is
6 what is the air quality like over the high country and the
7 wilderness areas, not which operations are listed on paper. All
8 emissions have to be modeled; otherwise we are just playing
9 games.

10 Number three, lessees must be required to monitor
11 visibility and acid deposition inside the wilderness areas, first
12 to obtain baseline data, and second, to record any changes
13 associated with new leases.

14 In the scoping comments, on the EIS, the Mountain Club
15 requested that regarding Mt. Zirkel, Flattops and the Maroon
16 Bells-Snowmass Wilderness areas, there be a specific analysis
17 of the following: visibility degradation, concentration of fine
18 particles, and acid deposition impacts on lichen, brook trout,
19 aspen and the pH of selected lakes. To the best of my knowledge,
20 this specific information is not in the Draft, although it is
21 referred to beginning in the discussion on page 109. These are
22 difficult questions, but they are the questions to which we want
23 answers.

24 In their scoping comments, the Mountain Club also
25 requested that preference in the leasing procedure be given to

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1 operators demonstrating zero-emission technology and demon-
2 strating less labor-intensive technology. This relates to the
3 second goal of the Prototype Program which is to develop a full
4 range of environmental safeguards. These suggestions were not
5 addressed. The impression is given that in the Prototype Program,
6 designed, among other things, to develop environmental safe-
7 guards, BLM is looking only at the materials to be mined and not
8 at technology which truly produces environmental safeguards. We
9 ask that the Final correct this impression.

10 Impacts on wilderness areas are address with respect
11 to increments in the air quality section. The consequences of
12 these impacts need to be addressed throughout the document and
13 in the sections on wildlife, vegetation and recreation. Brook
14 trout, aspen and lichens are considered as indicator species of
15 impacts on wildlife and vegetation. Visibility is a recreational
16 resource. For example, page 155 discusses visual impacts, but
17 only in and around the tracts. There is no mention of wilderness
18 areas; neither is there mention of the severe particulate problem
19 and therefore visibility problems, over a wide area in western
20 Colorado. This problem is documented on page 54 and discussed on
21 page 121, but not included in the later discussions.

22 Seven, In considering air quality, wildlife, vegetation
23 and recreational impacts, BLM must not only look at the wilder-
24 ness areas. Most of the White River National Forest and the
25 Routt National Forest lie between the Piceance Basin and the

1 respective wilderness areas. There are grazing allotments,
2 timber, trout streams and scenic areas in these forests that will
3 be impacted.

4 Now I'd like to show you several slides of the Flattops
5 and the Zirkel Wilderness Areas so we can get a better under-
6 standing of the areas we're talking about.

7 (Slide.)

8 I don't know if everybody can see this. This is a
9 view of one of the many lakes in the Flattops Wilderness Area.
10 Flattops is known for its fishing. Flattops is the second
11 largest wilderness area in Colorado -- 235,000 acres.

12 (Slide.)

13 Flattops is situated so the visitor has incredible
14 views of other wilderness areas. This is looking northeast from
15 Flattops to the Zirkel Wilderness, some 80 to 90 miles away.

16 (Slide.)

17 This is looking east from the same point to the Gore
18 Range, some 60 to 70 miles away.

19 (Slide.)

20 This is looking southeast some 70 miles to the Holy
21 Cross Wilderness and in the center to the Maroon Bells-Snowmass
22 Wilderness. Any type of visibility degradation or regional haze
23 would affect these magnificent views.

24 (Slide.)

25 Here is a scene inside the Zirkel Wilderness near the

1 Are there any others present at this time that would like to
2 come forward and make a formal statement?

3 Yes; would you please come forward? Please state your
4 name and who you represent.

5 MR. YONKEY: My name is Bob Yonkey. I'm regional
6 counsel with the Environmental Defense Fund, the Boulder office.

7 We have a relatively large number of technical comments
8 on the EIS which we will be filing in written form by the
9 comment deadline, but there are a number of issues that I wanted
10 to highlight with our oral comments here today.

11 First, with respect to the treatment of alternatives,
12 we think that as a general matter, the EIS and historically I
13 think most of the EIS's in this area have been deficient in not
14 addressing alternatives beyond the narrow scope of the
15 responsibilities of the immediate management agency. In this
16 case, the EIS was prepared by the BLM and it reflects the BLM's
17 very narrow focus and does not look at the broader responsibilities
18 of the Secretary of Interior and does not look at broader alter-
19 natives which we think should include, at a minimum, addressing
20 other fuel alternatives and conservation alternatives.

21 In terms of other fuel alternatives, we think that
22 there should be a general discussion of a comparison between the
23 need for developing oil shale as a fuel resource as compared with
24 the likely development of fuel resources from expanding oil and
25 gas drilling that is now occurring under the -- partly under the

1 BLM's auspices in the Overthrust Belt, and also other synfuels
2 options.

3 In addition, there should be some emphasis given to
4 what will happen to the demand for, particularly, liquid fuels
5 as various conservation scenarios come into play, including
6 particularly the automobile fuel requirements which will
7 substantially reduce demand for liquid fuels during the next
8 decade.

9 The failure to address these broader alternatives, I
10 think, is a major deficiency and inconsistent with the require-
11 ments of NEPA.

12 In addition, there is a narrower set of alternatives
13 that should be addressed which are not. One of the consequences
14 of the Tenth Circuit's decision in EDF v. Andrus in which the
15 Court of Appeals held that it was not necessary for either the
16 Bureau or the Geological Survey to prepare an EIS associated with
17 its review and approval of a detailed development plan, thrusts
18 upon the Bureau and the Survey the responsibility to address
19 certain alternatives at this stage, at the leasing stage, which
20 the Court said need not be addressed at the plan approval stage.

21 I think those alternatives should include much more
22 detailed discussion on siting options, particularly with respect
23 to the air quality impacts of various site locations. One of
24 the things that is clear from the evaluation of the data,
25 particularly the meteorological data, is that the air quality

1 impacts will significantly be a function of the altitude at
2 which the major emitting points are located. If they are located
3 in valley terrain where trapping features of the local meteorological
4 conditions will cause pollutants to be concentrated,
5 then the local effects of that siting decision would be very
6 much different than if the sites are located on higher terrain
7 where the emissions will be exposed to regional transport winds.
8 Conversely, locations at higher elevations will have much more
9 significant impact on the higher terrain Class I areas.

10 And these tradeoffs are the kinds of tradeoffs that
11 NEPA intended be evaluated before the Government made a decision
12 which would significantly affect human environment. The failure
13 to address those kinds of tradeoffs in this study, and given
14 particularly the Tenth Circuit's decision that you need not
15 address them later, imposes a duty to address them now.

16 Another alternative that would fit into that category
17 would be to address some of the control technology options which
18 are not clearly set forth in the analysis.

19 The amount of emissions from the facilities that are
20 likely to be sited would clearly be a function of the types of
21 control technology and to the extent that there are options in
22 terms of the amount of pollution likely to result as a result of
23 the choice of control technology, those choices should be
24 evaluated.

25 Now, with respect to some of the specific air quality

1 impacts, we are generally pleased with the approach taken for
2 the analysis of NO₂ and SO₂, but we have some specific problem
3 with some of the other pollutants that were addressed in the
4 EIS. Before I pass SO₂ behind, I would like to note particularly
5 that you have neglected to treat the State Category I areas as
6 having legally enforceable limitations on SO₂, which are the
7 equivalent of a Federal Class I area, and there is an Attorney
8 General's opinion in Colorado in which the Attorney General said
9 that those provisions of the State statute establishing those
10 Category I increments are enforceable. They would apply
11 particularly to Dinosaur National Monument and Colorado National
12 Monument, and the failure to address the effects on those two
13 national monuments, given the limitations for SO₂ in the State
14 law, is a serious deficiency in the model.

15 One of the things the model assumed was certain worst-
16 case conditions based upon wind patterns that would blow in the
17 direction of the Flattops. Those worst-case analyses, of course,
18 do not address what the impacts will be when wind conditions are
19 in the direction of Dinosaur National Monument. Therefore, it's
20 impossible from the modeling that's performed for this EIS to
21 even begin to guesstimate what the impacts will be on the
22 Category I areas.

23 With respect to acid deposition, which is a point that
24 Anne made in her comments, we feel there are some serious
25 deficiencies in the modeling. You have made certain assumptions

1 regarding dry deposition, but there has really been no signifi-
2 cant effort to evaluate wet deposition. The data that has been
3 obtained from scientific investigations of the acid deposition
4 process in the East tends to indicate that between 70 and 80
5 percent of the sulfate acidity is formed and deposited through
6 the wet process. Assuming that that percentage prevails also
7 in the West, you have ignored what is probably the much more
8 significant process for acid deposition.

9 In that context we are, of course, generally interested
10 on the extent to which the relatively high volumes of SO₂ and
11 NOX will increase the existing rates of acid deposition in the
12 West and you have made some estimate in the EIS to summarize the
13 existing deposition data. But there has really been no effort
14 to attempt to characterize the vulnerability of the terrain and
15 what the effects of the additional amount of acid deposition that
16 would result from oil shale emissions would likely be.

17 Given the requirement of the Clean Air Act that the
18 Federal land manager may waive Class I increments in the event
19 that he determines that air quality related values will not be
20 adversely affected, and since the Forest Service -- Rocky Mountain
21 Region of the Forest Service has identified acid deposition as
22 one of the effects of air quality emissions which could well have
23 an impact on air quality related values, we think that that
24 requirement of the Clean Air Act imposes upon you a duty to make
25 a more careful analysis of what the likely consequences would be

1 of the increased acid deposition from these sources, particularly
2 with respect to the Class I areas which, of course, Congress
3 set aside to be preserved for all Americans and has also
4 established a special procedure under the Clean Air Act.

5 So, the type of modeling that is required to estimate
6 wet acid deposition, of course, is in its developmental stages.
7 There wouldn't be such a thing as an EPA-approved model for that
8 determination, but there have been some models developed for use
9 in the East. So we would suggest that you investigate which of
10 those models that have been developed in the East would be
11 appropriate for use in this setting.

12 But some effort must be made to use the best scientific-
13 ally-available procedures for attempting that analysis.

14 We also have concerns with respect to carbon monoxide
15 and I guess we'll leave those for our other written comments.

16 In closing, with respect to ozone, I think you have
17 indicated that the EIS relies upon the Uinta Basin EIS analysis
18 for ozone which, of course, was released only last Friday, which
19 has not shown up in my mailbox yet, and is not subject to any
20 review on our part and therefore it's impossible for us to
21 present any kind of comments here today on your ozone analysis
22 and it may well be appropriate for you to offer an additional
23 opportunity either for public hearing or at least a comment
24 period on the ozone factor that extends from the date the ozo-
25 analysis became available.

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1 MR. SMITH: Thank you, Bob. Are there any others
2 who would like to make a formal statement at this time? Kevin?

3 MR. MARKEY: Kevin Markey, Friends of the Earth.

4 I have a few comments and a few questions that I'd
5 like to raise at this point preliminarily. We will present a
6 more formal presentation at the Grand Junction hearing.

7 Three questions: Number one, are either of these
8 tracts, C-11 or C-18, involved in discussions which are
9 reportedly occurring between the Bureau of Land Management and
10 the Synthetic Fuels Corporation?

11 Secondly, we would like to know a little bit more
12 about the status of the sodium lease tract conflict, and whether
13 in fact there has been any agreement or any stipulation signed
14 by the owners of the sodium lease tract.

15 And thirdly, we think it's important and if it can be
16 done today it would be helpful, if not sometime very soon, to
17 clarify what, in fact, are the air quality assumptions in the
18 baseline as to which projects are actually being counted in the
19 emissions and the ambient air impacts.

20 Second of all, over the past several years, as BLM
21 and others have discussed the possibility of testing multi-
22 mineral technology, many environmentalists and other citizens
23 have sought a test of multi-mineral oil shale processing because
24 it might offer some environmental advantages such as reduced
25 waste disposal, reduced salt leaching, and the air pollution

1 clean-up potential of nahcolite, one by-product of multi-mineral
2 processing.

3 However, the Department of Interior's proposed lease
4 will not even require the processing of associated minerals as
5 it does not require the maximum economic recovery of nahcolite
6 or dawsonite. In our scoping comments and in several other
7 junctures we have mentioned the need for some sort of require-
8 ment to insure that this does, in fact, become a test of multi-
9 mineral technology, in contrast to the view that we would
10 require any specific technology. That's not the case. What we
11 would require or what we would like to see BLM require is, in
12 fact, maximum economic recovery of nahcolite and dawsonite.

13 Thirdly, you might think that after hearing the compli-
14 ments that have been paid to your EIS today by some members of
15 the environmental community, that only an EIS which describes
16 horror stories is going to get any compliments. That's not
17 exactly so. It is a good EIS, though, mainly because it is
18 fairly well written and it does make quite clear what the
19 assumptions and what the effects of the proposed actions are.
20 There are some problems, however; we never give unqualified
21 endorsements of anything.

22 First of all, it would be helpful to clarify the air
23 quality assumptions and it would also be helpful to have a list
24 at some point similar to the list which appears in the air
25 quality document, of the precise plants and what their production

1 ranges would be at various times during your scenarios.]

2 Second of all, it's absolutely crucial to assess the
3 health and safety impacts, especially for mine-assisted in-situ.
4 The Bureau of Mines, in their test at the Horse Draw facility,
5 has many times -- has considerable amounts of data in terms of
6 the amount of methane which is present at the lower levels, at
7 the lower horizons, and that needs to be assessed as well as the
8 general problems with mine-assisted in-situ.

9 The National Research Council's Committee on Synthetic
10 Fuels Facility Safety, which I served on, did an analysis of the
11 various problems associated with oil shale and other synthetic
12 fuels technologies, and the one technology which received the
13 lowest grades was in fact mine-assisted in-situ and it's
14 important to look at that.

15 As has already been mentioned, there's an inadequate
16 analysis concerning energy alternatives. We'll discuss that
17 further in Grand Junction. And there are several larger land-
18 use considerations. It's not clear that, in fact, C-11 and C-18,
19 C-11 or C-18, are the best tracts to achieve the goals and
20 objectives of this particular leasing action.

21 If there is any leasing, we would prefer C-18, and only
22 C-18, and I think the problems which you have in terms of
23 resolving the sodium lease conflict indicates the error of
24 issuing more sodium leases up there in the Piceance Basin and a
25 need to reassess that entire action there.

1 Finally, there have been problems. The Prototype
2 Program, if one were to look at it, at least at the symptoms of
3 what has happened over the last eight years, one would make the
4 assumption that the Prototype Program is a failure. It's a
5 failure because BLM failed to assess the maturity and readiness
6 of the technologies that in fact it desired to test back in
7 1973-1974.

8 Those technologies could perhaps be classified as
9 obsolete even then when they were offered at that time. Today
10 we are quite a ways -- we have progressed quite a ways in terms
11 of research and development and still the industry is not ready
12 to proceed. BLM could be making another mistake which will lead
13 to the no diligent development, greater uncertainties, with
14 respect to speculative land holdings and uncertainties as to
15 whether development will occur at all, the possibility of new
16 Colony projects which will fail in mid-stream, and increase the
17 uncertainty of planning and in dealing with the impacts in the
18 communities in northwest Colorado.

19 So it's important to address the maturity and readi-
20 ness of the technologies which are the objective of this leasing
21 action as part of the EIS for there to be some type of stipu-
22 lation which in fact requires any bidders on those leases to
23 demonstrate the maturity and readiness of the technologies.

24 We perhaps can return to those questions if there's
25 nobody else.

1 MR. SMITH: Thank you. What we'll do on the questions
2 Kevin, we'll go ahead and see if there's any other formal
3 statements. If so, we'll take those and then we'll get right
4 into the questions.

5 Are there any other formal statements at this time?
6 Yes?

7 MR. MULLEN: My name is Norm Mullen and I'm with the
8 Colorado Open Space Council and I'm also speaking today for the
9 Colorado Wilderness Network.

10 The Colorado Open Space Council is Colorado's state-
11 wide conservation coalition of 48 member organizations which have
12 a cumulative membership of 30,000 to 40,000 people and also
13 there are about 1100 individual members of the Colorado Open
14 Space Council.

15 We've already heard a lot today about the effects on
16 the wilderness areas of Mt. Zirkel and Flattops, so we are very
17 concerned about those.

18 We're also concerned about the effects on Rifle. The
19 Colorado Open Space Council helped to start the Clean Air
20 Coalition and when we see 24-hour standards exceeding the annual
21 average by 41 times in Rifle, we're concerned about that also.

22 It seems as if the Impact Statement should discuss the
23 air quality related values and the impacts of these projects and
24 the No Action Alternative on air quality related values more
25 than it does and go into more detail about how the exceeding the

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1 increments will affect those values.

2 That's all. Thank you.

3 MR. SMITH: Are there any others?

4 (No response.)

5 MR. SMITH: If not, I guess we'll go into a few
6 minutes of questions and answers.

7 Kevin, on your's, there's some other BLM'ers in the
8 audience. As far as I know, there are no discussions between
9 the Synfuels and C-11 and C-18. Now, if there's any other
10 BLM'ers that know otherwise ---

11 MR. SINGLAUB: We're just from Meeker.

12 MR. SMITH: They're shaking their heads "no".

13 MR. MARKEY: Could I ask another clarifying question
14 on that? Whether there are any discussions taking place with
15 Synthetic Fuels Corporation on other tracts which might, in fact,
16 have an effect on the cumulative analysis which is being done
17 for this EIS?

18 MR. SMITH: Apparently no, Kevin, there is not.

19 Your second one on the progress we're making with the
20 Wolf Ridge lease. There's been a substantial amount of
21 negotiation. Again, as far as I'm aware, there is no final
22 agreement reached; is that right, Bob?

23 MR. LEOPOLD: Kevin, we anticipate September 4th that
24 we will have a draft cooperative agreement from Wolf Ridge to
25 the BLM. At that time we will sit down internally and also with

1
2
3 DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT
4 STATEMENT FOR THE PROTOTYPE OIL SHALE
5 LEASING PROGRAM
6
7
8

9 BUREAU OF LAND MANAGEMENT PARTICIPANTS:

10 CURT SMITH, AREA MANAGER

11 JOHN SINGLAUB, OIL SHALE PROJECT TEAM LEADER
12
13
14
15

16 -----
17 TRANSCRIPT OF PROCEEDINGS AT THE PUBLIC
18 MEETING, HELD AT THE FAIRFIELD CENTER, MEEKER,
19 COLORADO, ON WEDNESDAY, AUGUST 25, 1982,
20 COMMENCING AT APPROXIMATELY 7:00 P.M., BEFORE ME,
21 KAREN WITEK, CERTIFIED SHORTHAND REPORTER IN AND FOR
22 THE STATE OF COLORADO.
23
24
25

OUT BY YOU.

THE ONLY COMMENTS I WOULD HAVE IS, AS A
RANCHER -- AND I'M SPEAKING FOR THE COLORADO CATTLEMEN
AND THE COLORADO WOOLGROWERS HERE TODAY -- IS THAT WE
ARE NOT CONCERNED WITH THE LITTLE AREA THAT THESE
LEASES WILL TAKE UP. WE KNOW THAT WE CAN GET ALONG
WITH THE OIL COMPANIES. WE KNOW WE CAN GET ALONG WITH
THE ROADS THEY WILL BUILD, AS LONG AS WE CAN USE THEM
TOO TO MANAGE OUR LIVESTOCK.

ONE CONCERN OF OURS IS THE PEOPLE THAT WILL
BE OUT THERE. IT'S GOING TO AFFECT OUR GRAZING, OUR
MANAGING OF OUR LIVESTOCK. WE WOULD BE REAL CONCERNED
ABOUT OFF-ROAD VEHICLE TRAVEL. I THINK IF WE CAN KEEP
THE WORKERS, THE PEOPLE THAT ARE MOVING INTO THESE
AREAS -- I THINK, JOHN, YOU SAID THAT THERE WOULD BE A
20 PERCENT INCREASE IN RIFLE AND SEVEN PERCENT INCREASE
A YEAR IN MEEKER, AND THIS IS A LOT OF PEOPLE.

THESE PEOPLE KNOW THAT THOSE LANDS ARE THERE
AND THEY ARE GOING TO BE TRAVELING ALL OVER. THIS IS
OUR BIG CONCERN, TO KEEP THESE PEOPLE ON THE MAIN
TRAVELED ROADS. SET UP AREAS FOR THEM TO CAMP ON AND
STUFF, SO THEY WON'T BE RUNNING AROUND AT RANDOM, IN
THE WINTERTIME SNOWMOBILING ALL THROUGH AND CHASING OUR
LIVESTOCK AND THE WILDLIFE, TOO. I THINK THE
DEPARTMENT OF WILDLIFE SHOULD BE, DIVISION OF WILDLIFE

294

1 SHOULD BE REAL CONCERNED ON THIS, TOO. IT'S ABOUT
2 ALL THE COMMENTS I WOULD HAVE. THANK YOU.

3 CURT SMITH: THANK YOU, NICK. CONNIE
4 ALBRECHT?

5 CONNIE ALBRECHT: I AM CONNIE ALBRECHT.
6 I AM WITH FRIENDS OF THE EARTH. I AM THE COLORADO WEST
7 REPRESENTATIVE FROM GRAND JUNCTION, AND I AM SPEAKING
8 IN THAT CAPACITY THIS EVENING.

9 RATHER THAN ZERO IN ON SPECIFIC STATEMENTS
10 IN THE E.I.S., I WOULD LIKE TO TALK ABOUT A FEW OF THE
11 GENERAL SHORTCOMINGS WE HAVE FOUND. WE WILL BE
12 SUBMITTING MORE DETAILED WRITTEN COMMENTS LATER.

13 FIRST OFF, I WOULD LIKE TO SHARE JUST A
14 GENERAL REACTION I HAVE GOTTEN FROM PEOPLE WHEN I HAVE
15 TRIED TO EXPLAIN TO THEM WHY THE FEDERAL GOVERNMENT IS
16 PLANNING TO LEASE MORE SHALE LANDS IN THE MIDST OF A
17 RECESSION AND AN INDUSTRY BUST. I HAVEN'T BEEN DOING
18 THIS ONLY WITH ENVIRONMENTALISTS. I HAVE BEEN
19 ORGANIZING, TALKING TO THE GENERAL PUBLIC, TO COUNTY
20 OFFICIALS, TO MEDIA PEOPLE. THE FIRST REACTION IN MOST
21 CASES IS SIMPLE DISBELIEF. THE SECOND REACTION, AND I
22 THINK THE LEADERSHIP OF THE DEPARTMENT OF INTERIOR
23 WOULD DO WELL TO TAKE THIS INTO CONSIDERATION -- THE
24 SECOND REACTION IS A QUESTION OF, WHY DO WE NEED TO
25 LEASE MORE PUBLIC OIL SHALE LAND AT THIS TIME WHEN

1 THERE'S LITTLE DEVELOPMENT OCCURRING, OR LITTLE
2 INTEREST BY THE COMPANIES IN DEVELOPING OIL SHALE? WHY
3 ARE WE TRYING TO LEASE OUT A PUBLIC RESOURCE?

4 I HAVE TRIED TO EXPLAIN TO THEM THAT THE
5 STATES REALLY DON'T WANT THIS PROTOTYPE OIL SHALE
6 PROGRAM AT THIS TIME. THE COMPANIES AREN'T VERY
7 INTERESTED IN IT. THE COUNTIES HAVE SOME CONCERNS.
8 THE ENVIRONMENTALISTS THINK IT'S CRAZY, AND THE LOCAL
9 BLM KNOWS BETTER. BUT YOU HAVE A TEAM LIKE WE HAVE AT
10 THE TOP OF THE DEPARTMENT OF INTERIOR, AND THEY ARE
11 BASICALLY PUSHING FOR AS MUCH PUBLIC LAND TO BE LEASED
12 BEFORE THE 1984 ELECTIONS AS THEY CAN. THAT DOESN'T
13 GIVE US A LOT OF ROOM FOR ENVIRONMENTAL CONCERNS.

14 I APPRECIATE THE MEEKER OFFICE PUTTING
15 TOGETHER SUCH A FAST DRAFT E.I.S. I WOULD LIKE TO
16 SUGGEST A FEW CHANGES AND ADDITIONS FOR THE FINAL ONE.

17 THE AIR QUALITY INFORMATION IN THE E.I.S.
18 WAS VERY STARTLING. ALTHOUGH IT CONFIRMED WHAT
19 ENVIRONMENTAL GROUPS SUSPECTED WAS THE CUMULATIVE
20 IMPACT OF VARIOUS SHALE PROJECTS, WHAT WAS REALLY GOING
21 TO PIN US TO THE WALL, AND THE NO ACTION ALTERNATIVE
22 REALLY SHOWED THAT. HOWEVER, IT WASN'T CLEAR IN MUCH
23 OF THE BODY OF THE REPORT WHAT EXACTLY THE BASELINE
24 ASSUMPTIONS WERE. THEY NEED TO BE MORE CLEARLY
25 DOCUMENTED. I SUSPECT THIS WILL BE DONE.

1 SECONDLY, I AM GLAD TO SEE THE SENSITIVITIES
2 IN THE E.I.S. TO THE CLASS ONE AREAS, BUT I WOULD LIKE
3 TO SEE MORE DISCUSSION ON CLASS TWO AREAS EAST OF THE
4 PICEANCE BASIN AND GRAND JUNCTION. I COULD NOT FIND
5 ANY EVIDENCE OF POLLUTION FROM OTHER SOURCES, AND I AM
6 SPEAKING MAINLY OF AUTOMOBILE USE FROM THE INCREASED
7 POPULATION WITH THE SHALE DEVELOPMENT. ALSO NO
8 EVIDENCE AS TO WHETHER FACILITIES SUCH AS UPGRADING OR
9 REFINERY EXPANSION WERE INCLUDED. I WOULD STRONGLY
10 SUGGEST INCLUSION OF THESE. I THINK THEY COULD BE
11 SIGNIFICANT SOURCES, AND WE ARE FINDING THAT TO BE THE
12 CASE ALREADY IN THE GRAND VALLEY.

13 LASTLY, I THINK YOU DID A GOOD JOB IN TRYING
14 TO PAINT THE WHOLE PICTURE OF THE WHOLE IMPACT IN THE
15 REGION FROM AIR POLLUTION FROM THESE PLANTS. IN TERMS
16 OF WATER, THE STRESS BEING ON THE DE-WATERING OF THE
17 MINES PLUS THE LEACHING OF CONTAMINANTS, I FELT THAT
18 THIS WAS A RATHER LIMITED VIEW OF THE WATER SITUATION.
19 IT IS HARD TO PREDICT EXACTLY WHAT THE RESULTS ARE
20 GOING TO BE FROM DE-WATERING, SINCE WE HAVEN'T HAD THE
21 LONG-TERM THAT WE TRULY NEED BECAUSE THE CURRENT
22 PROTOTYPE TRACTS HAVE NOT GIVEN US THAT. THE E.I.S.
23 SHOULD CONTAIN MORE ANALYSES OF THE METHOD OF
24 TRANSPORTING THE WATER AND THOSE AFFECTS. HOW WOULD
25 ARSENIC CONTAMINATION OR STREAMS DRYING OUT AFFECT THE

1 CATTLE INDUSTRY OR OTHER USERS IN THE REGION? THERE
2 SHOULD BE MORE DETAILS ON IMPACTS IN THE WHITE RIVER,
3 AND ALSO THERE'S NO MENTION IN THE E.I.S. ON WATER
4 AVAILABILITY OR OWNERSHIP OF WATER RIGHTS AS FAR AS THE
5 DEVELOPMENT OF THESE TRACTS. WHAT WOULD ACTUALLY BE
6 POSSIBLE TO DEVELOP, GIVEN THE CONSTRAINTS ON WATER?

7 AS FAR AS WILDLIFE HABITAT, C-18 WOULD BE
8 LESS DESTRUCTIVE IN TERMS OF ITS EFFECT ON HABITATS IF
9 IT WERE LEASED. IT WOULD SEEM TO US THAT TAKING
10 HABITAT OUT OF COMMISSION IS IN DIRECT CONFLICT TO WHAT
11 THE STATE DIVISION OF WILDLIFE GOAL IS, WHICH IS
12 INCREASING THE DEER HERD SIZE IN THE PICEANCE BASIN,
13 WHICH IS A RESOURCE THAT THE AREA DOES BENEFIT FROM.

14 I AM HAPPY YOU HAVE GIVEN SOME ESTIMATE AS
15 TO THE CROP LANDS THAT WOULD BE TAKEN OUT OF
16 PRODUCTION, MOSTLY DUE TO THE URBANIZATION THAT WOULD
17 ACCOMPANY OIL SHALE DEVELOPMENT. I DO QUESTION YOUR
18 STATISTICS AND YOUR FORMULA. GIVEN THE SITUATION WE
19 HAVE HAD, FOR EXAMPLE, IN MESA COUNTY, YOUR FORMULA
20 MAYBE CONSERVATIVE IN ITS ESTIMATES OF CROP LAND LOSS.
21 I SUGGEST THAT FOR THE FINAL E.I.S. YOU TAKE A LOOK AT
22 THE STATE AGRICULTURAL LANDS REPORT, AS WELL AS SOME OF
23 THE COUNTY STATISTICS AND GET A BETTER IDEA OF CROP
24 LANDS ALREADY TAKEN OUT OF PRODUCTION.

25 ON THE SOCIO-ECONOMIC SECTION, WE WERE

1 SOMEWHAT DISAPPOINTED. THERE ARE QUITE A FEW NEW
2 REPORTS AND DOCUMENTS ON SOCIO-ECONOMIC PROBLEMS AND
3 SOLUTIONS THAT HAVE COME OUT OVER THE LAST COUPLE OF
4 YEARS, WHICH I DID NOT SEE LISTED OR UTILIZED IN THE
5 DRAFT E.I.S. WE COULD HAVE SOMEONE DEVELOP SOME
6 TESTIMONY FOR US ON SOCIO-ECONOMIC CONCERNS TO BE
7 SUBMITTED, INCLUDING SOME REFERENCES THAT I THINK THE
8 BLM COULD USE. SO I WON'T DWELL ON THAT, EXCEPT TO SAY
9 AT THIS TIME THAT OUR POSITION IS, IF ANY OF THESE
10 PROTOTYPE LEASES ARE LET, THIS TIME AROUND WE WOULD
11 LIKE TO SEE SOME REAL SOCIO-ECONOMIC IMPACT MITIGATION
12 AS A LEASE STIPULATION. IN OTHER WORDS, WE DON'T WANT
13 JUST MONITORING THIS TIME INCLUDED IN THE LEASE. WE
14 WANT SOME IMPACT PLAN WITH SOME KIND OF MONETARY
15 BACK-UP TO IT.

16 A FEW WORDS ON TECHNOLOGY. THERE'S SO MUCH
17 UNTRIED TECHNOLOGY IN THE SHALE FIELD, THE FOUR CURRENT
18 PROTOTYPES HAVEN'T PROVED MUCH IN TERMS OF PREFERRED
19 RECOVERY METHODS OR RECLAMATION. SO I UNDERSTAND THAT
20 THE BLM HAS VERY LITTLE TO GO ON. HOWEVER, I WAS
21 SURPRISED TO SEE THE EMPHASIS IN THE E.I.S. ON THE MINE
22 ASSISTED IN SITU PROCESS. THE FEW EXPERIMENTS WITH IN
23 SITU HAVEN'T BEEN ENCOURAGING, AND I THINK THE E.I.S.
24 SHOULD LOOK MORE IN DEPTH AT THE OTHER KINDS OF OIL
25 SHALE TECHNOLOGIES IN ADDITION TO IN SITU; BECAUSE OUR

1 CONTENTION IS THAT THE COMPANIES ARE LIKELY TO GO FOR
2 DIRECT MINING SURFACE RETORTING. THAT REALLY NEEDS TO
3 BE ANALYZED.

4 LASTLY, ON THE TECHNOLOGY, THERE HAS TO BE
5 SOME REAL ANALYSIS BEFORE GIVING OUT THESE LEASES OF
6 THE MATURITY OF THESE OIL SHALE TECHNOLOGIES, AND TO
7 MAKE SURE WE ARE REALLY LEASING SOMETHING AND THAT THIS
8 TIME AROUND IT'S GOING TO PRODUCE SOMETHING.

9 I HAVE A COUPLE THINGS I WILL SKIP OVER HERE
10 AND TRY TO WRAP UP. IN THE PAST, FRIENDS OF THE EARTH
11 HAS BEEN SUPPORTIVE OF TESTING OF MULTIMINERAL
12 TECHNOLOGY ON A LEASE. HOWEVER, WE DON'T FEEL LIKE WE
13 CAN IN GOOD FAITH GO ALONG WITH THE CURRENT ATTEMPT TO
14 LEASE MORE PROTOTYPE LEASES FOR
15 THE FOLLOWING REASONS: I SAY AT THIS TIME, BECAUSE
16 WE ARE NOT SAYING NEVER LEASE ANOTHER PROTOTYPE TRACT.
17 HOWEVER, AT THIS TIME WE FEEL IT SHOULD NOT BE DONE.
18 ONE, THERE IS A RECESSION, AND REALLY A LACK OF
19 INTEREST ON THE PART OF THE COMPANIES. THEREFORE, WE
20 REALLY FEEL LIKE THE LEASE SALE WILL NOT GENERATE
21 ADEQUATE SALES PRICES. THEREFORE, THE OIL SHALE TRUST
22 FUND MONEY WILL BE LESS FOR THE WESTERN SLOPE.

23 NUMBER TWO, WE DO NEED MORE REAL EXPERIENCE
24 WITH OIL SHALE BEFORE DOING LEASING, AND THE CURRENT
25 FOUR LEASES ARE NOT OPERATIONAL. I SUGGEST THE BLM GET

1 THERE'S NO WAY OF DETERMINING THE CARRYING CAPACITY OF
2 THE PICEANCE BASIN, I THINK IT'S BETTER TO HAVE THIS
3 TYPE OF INFORMATION BEFORE WE GO AHEAD WITH THE
4 PROTOTYPE, BUT ALSO WITH THE PROGRAMS.

5 LASTLY, THERE IS NO STIPULATION IN YOUR
6 LEASE THAT STATES THAT THERE WILL BE MULTIMINERAL
7 RECOVERY REQUIRED. WE ARE NOT TRYING TO DICTATE HERE
8 WHAT KIND OF TECHNOLOGY THE COMPANY SHOULD USE, BUT
9 THERE SHOULD BE A STIPULATION THAT IT'S MULTIMINERAL
10 RECOVERY, IF THAT'S WHAT THIS PROGRAM IS ABOUT. THAT
11 SHOULD BE IN THE LEASE.

12 THAT'S ABOUT ALL I HAVE TO SAY, UNLESS YOU
13 HAVE ANY QUESTIONS FOR ME. THANK YOU.

14 CURT SMITH: THANK YOU, CONNIE. MARK
15 BUBRISKI?

16 MARK BUBRISKI: I AM MARK BUBRISKI. I
17 AM THE IMPACT COORDINATOR HERE IN RIO BLANCO COUNTY. I
18 WANT TO MAKE APOLOGIES FOR ALLEN JONES, THE CHAIRMAN OF
19 THE COUNTY COMMISSIONERS, WHO UNFORTUNATELY CAME DOWN
20 WITH A BAD CASE OF THE FLU OR SOMETHING THIS AFTERNOON.
21 HE IS HOME TRYING TO RECOVER FROM THAT.

22 I HAVE A STATEMENT HERE THAT I WOULD LIKE TO
23 SHARE WITH YOU TONIGHT. WE ARE GOING TO CONFINE OUR
24 COMMENTS PRIMARILY TO THE SOCIO-ECONOMIC ASPECTS OF THE
25 E.I.S. AGAIN, I WANT TO THANK YOU FOR THE OPPORTUNITY

1 HERE TO COMMENT. BEFORE OUTLINING THE COUNTY'S
2 SPECIFIC CONCERNS REGARDING THE DATA AND ASSUMPTIONS
3 USED IN THE SOCIO-ECONOMIC SECTIONS OF THE E.I.S., WE
4 WOULD LIKE TO STATE THAT RIO BLANCO COUNTY DOES SUPPORT
5 THE LEASING OF ADDITIONAL OIL SHALE TRACTS C-11 AND
6 C-18, PROVIDED THAT THE COUNTY HAS SUFFICIENT
7 OPPORTUNITY TO REVIEW AND COMMENT ON THE RELATED
8 MITIGATION PLANS ASSOCIATED WITH ANY FUTURE LESS EAST.

9 ALSO THE COUNTY REQUESTS THE OPPORTUNITY TO
10 ADDRESS FUTURE ADDITIONAL LEASES SUCH THAT IMPACTS FROM
11 THOSE LEASES AND THOSE PROJECTS WOULD BE DISPERSED IN A
12 TIMELY AND DILIGENT MANNER, SO AS TO MINIMIZE ANY
13 IMPACTS AFFECTING RIO BLANCO COUNTY. SPECIFICALLY, WE
14 HAVE THE FOLLOWING COMMENTS. THE E.I.S. ESTIMATES THE
15 PERCENTAGE OF POPULATION IMPACT ABOVE THE BASELINE
16 GROWTH FOR DEVELOPMENT OF BOTH C-11 AND C-18 TRACTS TO
17 BE 18 TO 20 PERCENT DURING THE PEAK YEAR 1988 IN
18 RANGELY, WHILE IT DROPS TO 12 PERCENT FOR THE
19 OPERATIONS IN 1993. FOR MEEKER, THE POPULATION IMPACT
20 WOULD BE 60 TO 75 PERCENT DURING THE PEAK, AND 39 TO 42
21 PERCENT DURING OPERATIONS. OVERALL, THE POPULATION
22 IMPACTS WOULD BE VERY SEVERE FOR MEEKER, WITH BOTH
23 TRACTS DEVELOPED; AND SEVERE WITH ONLY DEVELOPMENT.

24 WHILE FOR RANGELY THE DEGREE OF SEVERITY
25 WOULD BE SEVERE WITH BOTH AND MODERATE WITH ONE. THE

1 E.I.S. STATES THAT THE GROWTH RATE FOR HEEKER IN THE
2 BASELINE CASE IS FIVE TO SEVEN PERCENT ANNUAL GROWTH,
3 WHICH IS MANAGEABLE. WE BELIEVE ANYTHING OVER THREE
4 PERCENT ANNUAL GROWTH IS CONSIDERED BY MOST
5 SOCIO-ECONOMIC AUTHORITIES AS SEVERE IMPACT. UNDER THE
6 HIGH SCENARIOS OF DEVELOPMENT OF BOTH C-11 AND C-18,
7 HEEKER WOULD GROW FROM 4500 IN 1983 TO A PEAK OF 10,500
8 IN 1989, FOR AN ANNUAL GROWTH RATE OF 20 PERCENT.

9 THE E.I.S. GOES ON TO STATE THAT HEEKER
10 WOULD EXPERIENCE SEVERE QUALITY OF LIFE DETERIORATION
11 UNDER THE LOW SCENARIO, DEVELOPMENT OF ONE TRACT, AND
12 VERY SEVERE DETERIORATION WITH BOTH TRACTS DEVELOPED.
13 RANGELY WOULD BE SEVERELY IMPACTED WITH BOTH DEVELOPED.
14 CASE, IT IS UNLIKELY THAT THE INCREASED REVENUES
15 RECEIVED BY COMMUNITY WOULD OFFSET THE CAPITAL AND
16 OPERATING COSTS THAT WOULD BE NECESSITATED BY SUCH
17 RAPID GROWTH, AND HEAVILY IMPACTED TOWNS WOULD NEED
18 LARGE INFUSIONS OF ASSISTANCE."

19 THERE IS NO SUGGESTION IN THE E.I.S. AS TO
20 WHO WOULD PROVIDE THE ASSISTANCE OR HOW THESE IMPACTS
21 WOULD BE MITIGATED.

22 I HAVE ANOTHER CONCERN REGARDING THE
23 PERCENTAGE OF IN-MIGRATION WORKERS. THE E.I.S. ASSUMES
24 THAT THE PERCENT OF IN-MIGRATION CONSTRUCTION WORKERS
25 WILL BE 50 TO 75 PERCENT. THIS ASSUMES THAT THERE WILL

BE A HIGH DEGREE, ROUGHLY 50 TO 30 PERCENT, OF EXISTING
UNEMPLOYED LABOR FORCE OR THAT THE POTENTIAL FOR TRADE
UNION REQUIREMENTS WILL BE MINIMAL. NO ONE KNOWS WHAT
THE SITUATION WILL BE WITH THAT. THE ASSUMPTION THAT
THERE WILL BE A FAIRLY SIGNIFICANT PERCENTAGE OF LOCAL
EMPLOYABLE WORKERS MINIMIZES THE POTENTIAL O/M COSTS
AND POTENTIAL CAPITAL COSTS OF INFRASTRUCTURE
DEVELOPMENT. ALSO, HOUSING NEEDS WOULD BE FALSELY
MINIMIZED AS WELL.

IN SUMMARY, THE E.I.S. ASSUMES A MARGINAL
DEGREE OF IN-MIGRATION, HIGH PERCENT OF EXISTING LABOR
FORCE, AND THUS ASSUMES A REDUCED NEED FOR
INFRASTRUCTURE DEVELOPMENT AND OPERATING COSTS.

A COUPLE OF ADDITIONAL STATEMENTS MADE IN
THE E.I.S. WE BELIEVE ARE INACCURATE. THE E.I.S.
STATES THAT A SURVEY IN MEEKER OF 350 RESIDENTS IN 1975
FOUND 51 PERCENT PREFERRED THE ESTABLISHMENT OF A NEW
TOWN CLOSE TO THE MINE SITES IN PICEANCE. THIS SHOULD
BE UPDATED OR DELETED FROM THE E.I.S. THE E.I.S.
STATES THAT THE RANGELY HOSPITAL AND SCHOOLS HAVE LOW
OCCUPANCY RATES THAT CAN ABSORB CONSIDERABLE GROWTH.
THE E.I.S. DOES NOT QUALIFY "CONSIDERABLE" AND MAKES NO
OTHER CAPACITY STATEMENTS REGARDING OTHER FACILITIES IN
MEEKER AND RANGELY.

THE RANGELY SCHOOL DISTRICT IS CURRENTLY

1 EXPERIENCING SOME OVERCROWDING IN THE ELEMENTARY AND
2 MIDDLE SCHOOL. THE E.I.S. STATEMENT IS INACCURATE.

3 IN CONCLUSION, THE E.I.S. MAKES SEVERAL
4 BROAD STATEMENTS RELATED TO WHAT THE EXPECTED IMPACTS
5 MIGHT BE, BUT OFFERS NO CONCRETE SOLUTIONS AS TO HOW
6 THESE PROBLEMS, ESPECIALLY FISCAL IMPACTS, WILL BE
7 ADDRESSED. RIO BLANCO COUNTY HOPES THAT THE INTERIOR
8 DEPARTMENT THROUGH THE BLM RECOGNIZES THE NEED FOR
9 POTENTIAL LESSEES TO ACTIVELY OR DILIGENTLY MITIGATE
10 THE SOCIAL AND ECONOMIC IMPACTS TO BE FELT IN HEEKER
11 AND RANGELY. TO THIS END, WE REQUEST THAT AS PART OF
12 ANY FUTURE LEASING DECISIONS, THE BLM WOULD REQUIRE ALL
13 LESSEES TO MEET ALL REQUIREMENTS OF THE COUNTY
14 PERMITTING PROCESS PRIOR TO THE ISSUANCE OF THE FEDERAL
15 PERMIT.

16 ONCE AGAIN, THANK YOU FOR THE OPPORTUNITY TO
17 COMMENT ON THE DRAFT PROTOTYPE E.I.S.

18 CURT SMITH: THANK YOU, MARK. JUDY
19 GETCHELL?

20 JUDY GETCHELL: NOT AT THIS TIME.

21 CURT SMITH: LEE HERKEL?

22 LEE HERKEL: I AM GARFIELD COUNTY'S
23 IMPACT COORDINATOR. THE GARFIELD COUNTY COMMISSIONERS
24 REQUESTED THAT I COME AND MAKE A BRIEF COMMENT TONIGHT
25 TO INDICATE THEIR CONCERNS REGARDING A POTENTIAL

1 LEASING OF FEDERAL LANDS IN A NORTHWESTERN COLORADO
2 AREA SUCH AS C-11 AND C-18.

3 THE GARFIELD COUNTY COMMISSIONERS WOULD LIKE
4 TO ONCE AGAIN REGISTER THEIR CONCERNS REGARDING THE
5 ISSUANCE OF ADDITIONAL OIL SHALE LEASES IN FEDERAL
6 LANDS IN NORTHWESTERN COLORADO. MORE SPECIFICALLY,
7 THEIR CONCERNS CENTER AROUND THE PHASING OF THE
8 DEVELOPMENT AND THE INPUT THAT LOCAL ELECTED OFFICIALS
9 WILL BE ALLOWED REGARDING THE SOCIO-ECONOMIC EFFECTS OF
10 SUCH LEASING.

11 OIL SHALE DEVELOPMENT ON FEDERAL LANDS IN
12 ADDITION TO THAT WHICH IS ALREADY BEING DEVELOPED AND
13 PLANNED ON PRIVATE LAND IN REGION 11 COULD MEAN ADVERSE
14 SOCIO-ECONOMIC IMPACTS ON LOCAL GOVERNMENT
15 JURISDICTIONS. WITH FOUR OIL SHALE PROJECTS IN THE
16 EARLY PHASES OF DEVELOPMENT IN RIO BLANCO AND GARFIELD
17 COUNTIES IN 1981, SOME COMMUNITIES WERE EXPERIENCING
18 ANNUAL GROWTH RATES IN EXCESS OF 25 PERCENT. THE
19 BOARD, THEREFORE, REQUESTS THAT LOCAL GOVERNMENTS BE
20 GIVEN THE OPPORTUNITY TO PROVIDE SIGNIFICANT INPUT INTO
21 THE SOCIO-ECONOMIC IMPACT MITIGATION PROGRAMS WHICH
22 SHOULD BE REQUIRED AS CONDITIONS OF THE ISSUANCE OF
23 SUCH LEASES. THANK YOU.

24 CURT SMITH: THANK YOU, LEE. ED
25 GREENLEAF? I WANT TO MAKE A STATEMENT. YOU CAME IN

1 AFTER THE INTRODUCTION. WE ARE LIMITING EACH STATEMENT
2 TO EIGHT MINUTES.

3 ED GREENLEAF: THAT'S FINE. I AM A
4 RESIDENT OF PITKIN COUNTY, AND ALSO AS A PROFESSIONAL I
5 AM A SOCIAL WORKER. I AM NOT HERE TO SPEAK FOR ANY
6 PROFESSIONAL GROUP, MERELY AS A CITIZEN.

7 WHAT I WANTED TO ADDRESS ALSO HAD TO DO WITH
8 THIS SOCIO-ECONOMIC STATEMENT THAT WAS MADE IN THE
9 E.I.S. I ALSO FIND THOSE STATEMENTS TO BE SOMEWHAT
10 LIMITED IN TERMS OF THE RESULTS THAT THEY HAVE
11 INDICATED THEY FOUND. FOR INSTANCE, IN CHAPTER FOUR
12 THEY SPEAK ABOUT CERTAIN GROUPS THAT WERE FORMED IN THE
13 MEEKER AND RIFLE AREA THAT WERE ADVISORY HUMAN RESOURCE
14 COUNSEL TYPE THINGS THAT WERE SET UP TO LOOK AT WHAT
15 THE IMPACT WOULD BE ON SOCIO-ECONOMICS IN THAT AREA.

16 WHAT I SEEM TO HAVE TROUBLE WITH IS THE FACT
17 THAT, AT LEAST IT'S NOT INDICATED OTHERWISE, THAT THESE
18 WERE BASICALLY AD HOC GROUPS THAT WERE FORMED BY
19 INTERESTED CITIZENS IN THE COMMUNITY. THE POINT I AM
20 TAKING IS THAT PERHAPS IT IS NOT INCUMBENT UPON THESE
21 GROUPS, ALTHOUGH THEY ARE DEFINITELY INTERESTED
22 CITIZENS THAT WANT TO KNOW WHAT'S HAPPENING IN THEIR
23 COMMUNITY, BUT THERE MAYBE SOME QUESTION AS TO HOW
24 THOROUGH THEY WERE ABLE TO GATHER THE INFORMATION
25 LEADING TO THEIR COMMENTS, WHICH WOULD SAY THAT THERE

1 IS GOING TO BE SEVERE IMPACT IN THOSE COMMUNITIES.
2 HAVE THEY REALLY HAD AN OPPORTUNITY TO LOOK AT ALL OF
3 THE CHARACTERISTICS OR THE CONDITIONS THAT WOULD GO
4 INTO MAKING THOSE KIND OF CONCLUSIONS?

5 WHAT I AM SAYING IS, IT MIGHT BE MORE
6 INCUMBENT ON THE GOVERNMENT TO CONDUCT THOSE SORTS OF
7 SURVEYS USING THEIR SCIENTIFIC EXPERTISE TO GET AT
8 THOSE KINDS OF ANSWERS AND REALLY DO A THOROUGH JOB.

9 I ALSO NOTED ON PAGE 167 IN HERE THAT THE
10 CONCLUSIONS WERE THAT THE QUALITY OF LIFE WAS GOING TO
11 BE KIND OF A TRADE-OFF FOR PEOPLE. THERE WOULD BE SOME
12 PEOPLE WHO WOULD WIN AND SOME PEOPLE WOULD LOSE. SOME
13 PEOPLE, THE OLDTIMERS WOULD HAVE TO GIVE UP CERTAIN
14 THINGS THAT THEY WERE USED TO IN THE AREA. THERE WOULD
15 BE SOME THINGS THAT THE NEWCOMERS WOULD HAVE TO GIVE UP
16 AS THEY CAME INTO THE NEW AREA. I FIND THAT
17 QUESTIONABLE IN THE SENSE THAT THERE'S NO
18 QUANTIFICATION OF THAT. TO WHAT DEGREE IS THAT GOING
19 TO HAPPEN? TO WHAT DEGREE ARE THOSE KINDS OF THINGS
20 BEING TAKEN INTO CONSIDERATION IN THIS PLAN?

21 SO I AM HOPING THAT IN THE DEVELOPMENT AND
22 FINAL ADOPTION OF THIS E.I.S. THAT THERE IS GOING TO BE
23 SOME KIND OF REQUIREMENT ON THE PART OF THE OIL SHALE
24 COMPANIES WHO ARE EVENTUALLY LEASING THESE TRACTS TO
25 AFFORD SOME KIND OF FINANCIAL RESPONSIBILITY TO MAKE

1 SURE THAT THESE PROGRAMS ARE DEVELOPED. THANK YOU. J

2 CURT SMITH: THANK YOU, ED. DEE KNAPP?

3 DEE KNAPP: I AM ALSO HERE JUST TO
4 EXPRESS MY CONCERNS AS A PRIVATE CITIZEN. FIRST OF
5 ALL, BEFORE I START MY TESTIMONY, I DID WANT TO MAKE A
6 COMMENT ABOUT THE FACT THAT THE HEARINGS ON THIS
7 PARTICULAR E.I.S., AS WELL AS THE RESOURCE MANAGEMENT
8 PLAN AT THE SAME TIME, IS RATHER CONFUSING FOR THE
9 MAJORITY OF THE CITIZENS HERE. I DON'T KNOW IF THAT'S
10 BEEN ADDRESSED BEFORE, BUT IT'S VERY DIFFICULT TO
11 UNDERSTAND EXACTLY WHAT WAS GOING ON AND WHAT WE WERE
12 SUPPOSED TO ADDRESS AT THIS TIME WITH BOTH OF THESE
13 HEARINGS TOGETHER. SO I WILL DO THE BEST I CAN TO
14 ADDRESS WHAT I THINK I AM SUPPOSED TO BE ADDRESSING.

15 I UNDERSTAND THAT THE PUBLIC INVOLVEMENT
16 SCHEDULE FOR THE R.M.P. FOR THE PICEANCE BASIN HASN'T
17 EXACTLY BEEN SET OUT YET. I WOULD LIKE TO SAY THAT I
18 THINK THAT THAT'S VERY IMPORTANT THAT IT IS SET OUT,
19 THAT THE CITIZENS KNOW WELL IN ADVANCE WHEN THAT PUBLIC
20 PARTICIPATION PROCESS WILL OCCUR, AND THAT IT'S VERY
21 IMPORTANT THAT CITIZENS GET A CHANCE TO COMMENT ON
22 THESE THINGS, AND THAT WE HAVE MORE PUBLIC
23 PARTICIPATION AND NOT LESS. I UNDERSTAND, IT SEEMS THE
24 TREND THAT IS GOING IS THAT THERE IS GOING TO BE LESS
25 AND LESS PUBLIC PARTICIPATION INSTEAD OF MORE AND MORE.

1 AS FAR AS THE PROTOTYPE E.I.S. LEASING GOES,
2 I WANTED TO REITERATE AND EMPHASIZE SOME OF THE
3 COMMENTS THAT WERE MADE BY CONNIE ALBRECHT OF FRIENDS
4 OF THE EARTH. FIRST OF ALL, CONSIDERING THE OVERALL
5 TIMELINESS OF OIL SHALE LEASING TO THE CURRENT
6 RECESSION, I DON'T UNDERSTAND THAT MYSELF. I DON'T
7 UNDERSTAND WHEN EXXON CAME INTO THIS AREA AND SUDDENLY
8 PULLED OUT, SOMEHOW THE GOVERNMENT IGNORED THAT. THE
9 WHOLE PROCESS GOES ON. IT WOULD SEEM TO MAKE MORE
10 SENSE, IF THESE WERE GOVERNMENT LANDS, THAT THEY BE
11 LEASED LIKE A COMMUNITY LANDLORD WOULD LEASE THEIR OWN
12 PRIVATE LANDS, AT A TIME WHEN THE MOST MONEY CAN BE
13 GOTTEN OUT OF IT, WHEN THE INDUSTRY SEES THAT THEY CAN
14 MAKE A GOOD PROFIT, AND EVERYONE CAN BENEFIT BY IT.

(16)

15 I WOULD ALSO LIKE TO ADDRESS SOME OF THE
16 SOCIO-ECONOMIC STIPULATIONS THAT CONNIE ALBRECHT
17 MENTIONED SHOULD BE IN THE LEASE. I FEEL THIS IS VERY
18 IMPORTANT, THAT THE COMPANIES ARE HELD RESPONSIBLE FOR
19 THE SOCIO-ECONOMIC EFFECTS IN THE AREA. I WOULD HOPE
20 THAT IN THE LEASE AS WELL AS IN ANY RESOURCE MANAGEMENT
21 PLAN, THAT THERE IS CRITERIA PROVIDING FOR WHO WILL PAY
22 FOR THE INCREASED SOCIAL AND HUMAN SERVICES THAT WILL
23 BE NECESSARY.

(124)

24 I WOULD ALSO LIKE TO SEE ADDRESSED WHAT
25 HAPPENS WHEN THE ECONOMY NOT ONLY BOOMS BUT BUSTS. IT

(2)

1 SEEMS LIKE IN THE E.I.S. IT MAKES THE CONCLUSION THAT
2 EVERYONE WILL BENEFIT IN THE LONG RUN, THAT IF WE JUST
3 HANG ON LONG ENOUGH THAT EVERYONE CAN SEE THIS THROUGH
4 AND IT WILL BE GOOD FOR EVERYONE.

5 HOWEVER, OIL SHALE, LIKE ANY OTHER MINERAL,
6 IS FINITE. AT SOME TIME THE ECONOMY IS GOING TO BUST.
7 IT WON'T BOOM AND BOOM. THERE IS A POINT WHERE IT WILL
8 BUST OR THERE'S A POINT WHERE THE INDUSTRY PLAINLY
9 PULLS OUT, AS EXXON DID. I WOULD LIKE TO SEE THIS
10 ADDRESSED.

11 WHAT WILL HAPPEN THEN? WHAT HAPPENS TO THE
12 PEOPLE? WHAT HAPPENS TO THE PEOPLE WHEN THEY COME INTO
13 A COMMUNITY AND THEY ARE THERE, AND THEY DON'T KNOW
14 WHERE THEY ARE GOING TO RELOCATE, AND THERE ARE NO JOBS
15 AND THERE ARE NO TAXES THAT ARE PROVIDING FOR THE HUMAN
16 SERVICES THAT ARE NECESSARY FOR THESE PEOPLE BECAUSE
17 THE INDUSTRY IS GONE?

18 I WOULD LIKE TO EMPHASIZE THAT WATER QUALITY
19 AND AIR QUALITY NEEDS TO BE PROTECTED. THESE ARE
20 RESOURCES WHICH ARE ALSO FINITE. IF WE DON'T PROTECT
21 THEM, AT SOME POINT IN THE FUTURE WE WILL FIND THAT WE
22 DON'T HAVE ANY MORE. WATER SUPPLY IS SOMETHING IN AN
23 ARID AREA, THE WATER IS SCARCE AND IN MANY AREAS THE
24 RIVERS ARE ALREADY OVER-ALLOCATED.

25 WHAT ABOUT AGRICULTURE? WHAT ABOUT THE

1 CURT SMITH: THANK YOU, DON. ARE THERE
2 ANY OTHERS THAT WOULD LIKE TO MAKE A STATEMENT? YES?

3 JOHN OSSE: I'M JOHN OSSE, ADMINISTRATOR
4 OF PIONEERS HOSPITAL. I HADN'T PLANNED ON SPEAKING
5 THIS EVENING. I MOSTLY WANTED TO SEE WHAT WAS GOING ON
6 IN OIL SHALE, BUT A NUMBER OF CONCERNS HAVE ARISEN AS A
7 RESULT OF SOME OF THE REMARKS.

8 I HAVEN'T READ THE PLAN. GOING THROUGH THE
9 INDEX, I DON'T SEE ANYTHING ABOUT MEDICAL CARE IN TERMS
10 OF ADDRESSING THE SOCIAL AND ECONOMIC ASPECT. IN A
11 TOWN THIS SIZE IN HEEKER, WE ARE IT IN TERMS OF A
12 HOSPITAL, IN TERMS OF EMERGENCIES. THE HOSPITAL IS 17
13 BEDS WITH A 25-BED NURSING HOME. OF THE 17 BEDS, 11
14 ARE GENERAL MEDICAL BEDS; FOUR ARE OB. BEDS OR
15 OBSTETRIC BEDS, AND TWO ARE INTENSIVE CARE BEDS. WHAT
16 THAT MEANS, WE HAVE ALMOST NO FLEXIBILITY IN TERMS OF
17 MEETING ANY SUDDEN SURGE IN POPULATION.

18 FOR EXAMPLE, DURING HUNTING SEASON WE CAN
19 HAVE A BRIEF PERIOD OF 100 PERCENT OCCUPANCY, AND THEN
20 HAVE NO PATIENTS. THIS IS SIGNIFICANT WHEN YOU
21 CONSIDER THAT THE PLANNING TIME, ONCE THE NEED IS
22 ADDRESSED AND YOU SEE YOU HAVE A PROBLEM, WE HAVE THREE
23 YEARS BEFORE WE CAN EVEN START CONSTRUCTION. YOU CAN
24 START FOR THE PLANNING PHASE, THE ARCHITECTURAL PHASE,
25 THE FINANCING PHASE, THE REGULATORY PHASE. HOSPITALS

1 ARE USUALLY MORE REGULATED THAN NUCLEAR POWER PLANTS,
2 INCLUDING OUR LITTLE HOSPITAL UP HERE.

3 ASSUMING EVERYTHING GOES PERFECTLY WELL, YOU
4 MAY GET DONE IN TWO AND A HALF YEARS, AND THEN YOU CAN
5 START CONSTRUCTION AND THAT CAN TAKE ANOTHER YEAR,
6 DEPENDING ON THE TIME OF YEAR YOU START.

7 I WOULD LIKE TO SEE SOMETHING ADDRESSED IN
8 THE SOCIO-ECONOMIC ASPECT OF THIS PLAN. WE HAVE ALSO
9 GOT A PROBLEM IN TERMS OF MANPOWER RECRUITMENT,
10 PHYSICIAN RECRUITMENT, IN TERMS OF THESE DEMANDS COMING
11 UP. IT WOULDN'T TAKE VERY MUCH TO HAVE PEOPLE IN OUR
12 HALLS.

13 WE HAVE STARTED A PLANNING PROCESS, BECAUSE
14 APPROXIMATELY, AS I RECALL, ABOUT 42 PERCENT OF OUR
15 PATIENTS WERE FROM ENERGY COMPANIES, THAT INCLUDED
16 THEIR FAMILIES. NOW WE HAVE A BUST AND FORTUNATELY WE
17 DIDN'T DO ANYTHING. WE DIDN'T BUILD ANYTHING NEW AS A
18 RESULT OF THIS ANTICIPATED BOOM, OR WE WOULD BE IN REAL
19 TROUBLE.

20 IT'S GOING TO BE A VERY INTERESTING PLAN
21 BECAUSE WE WANT TO ADDRESS WHAT WE CAN DO NOW IF THE
22 ENERGY PEOPLE COME IN. A FIVE PERCENT POPULATION
23 INCREASE COULD IMPACT US VERY SEVERELY. SO I WOULD ASK
24 THAT THIS BE ADDRESSED TO GIVE US AS MUCH OPPORTUNITY
25 AS POSSIBLE, BECAUSE WE ARE GOING TO BE IMPACTED VERY

QUICKLY.

WITH THREE OR FOUR YEARS BEFORE WE CAN ADDRESS THAT NEED, ASSUMING EVERYTHING GOES RIGHT, WILL PRESENT A REAL HARDSHIP. WE ARE TALKING ABOUT CONSTRUCTION WORKERS. YOU ARE TALKING ABOUT HIGH TRAUMA. I DISCUSSED IT WITH MY NURSING STAFF, MEDICAL STAFF AND SOME OF THE LONG-TERM RESIDENTS HERE. I AM TOLD TWO OR THREE YEARS AGO WE HAD SOME CREWS COMING THROUGH WORKING ON POWER LINES, WHICH I UNDERSTAND WILL BE HERE THIS FALL, AND JUST THAT NUMBER IMPACTED OUR EMERGENCY ROOM, TAXED US SEVERELY.

YOU HAVE A LOT MORE ACCIDENTS, INDUSTRIAL ACCIDENTS, CAR ACCIDENTS. THEY TEND TO BE A LITTLE ON THE WILD SIDE, I AM TOLD. WE ARE NOT TALKING ABOUT A LOT OF FAMILIES, NECESSARILY. SO WE WOULD SURE APPRECIATE AS MUCH WARNING AS YOU CAN GIVE US, BASED ON PAST EXPERIENCE IN OUR COMMUNITY.

CURT SMITH: ARE THERE ANY OTHERS WHO WOULD LIKE TO MAKE A STATEMENT AT THIS TIME?

ONE THING, WRITTEN COMMENTS ARE DUE IN ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT BY SEPTEMBER SEVENTH. THEY SHOULD BE SENT HERE TO THE OFFICE IN MEEKER IN CARE OF JOHN SINGLAUB, THE OIL SHALE PROJECT'S TEAM LEADER, WHITE RIVER RESOURCE AREA, BOX 928, MEEKER.

THE HISTORY OF THE UNITED STATES

The history of the United States is a story of growth and change. It begins with the first settlers, who came to the Americas in search of a new life. They found a land of opportunity, but also a land of challenge. The early years were marked by conflict and struggle, as the settlers fought to establish their own communities. Over time, the United States grew from a small colony into a powerful nation. It was a process of constant evolution, shaped by the dreams and aspirations of its people. The story of the United States is a testament to the power of the human spirit and the ability of a nation to overcome adversity. It is a story of hope and progress, of a people who have built a great nation from the ground up. The history of the United States is a story that continues to inspire and inform us today.

1 AGAIN, ANY OTHER STATEMENTS? IF NOT, THE
2 HEARING ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT ON
3 PROTOTYPE OIL SHALE LEASING IS HEREBY ALJOURNED.

4 (CONCLUDED AT 8:15 P.M.)

6

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT
STATEMENT FOR THE PROTOTYPE OIL SHALE
LEASING PROGRAM

BUREAU OF LAND MANAGEMENT PARTICIPANTS:

CURT SHITE, AREA MANAGER

JOHN SINGLAUB, OIL SHALE PROJECT TEAM LEADER

TRANSCRIPT OF PROCEEDINGS AT THE PUBLIC
MEETING, HELD AT THE RAMADA INN CONVENTION CENTER, GRAND
JUNCTION, COLORADO, ON THURSDAY, AUGUST 26, 1982,
COMMENCING AT APPROXIMATELY 7:00 P.M., BEFORE ME,
KAREN WITEK, CERTIFIED SHORTHAND REPORTER IN AND FOR
THE STATE OF COLORADO.

1 BREAK.

2 WITH THAT, WE WILL CALL THE FIRST PERSON
3 THAT WOULD LIKE TO MAKE A STATEMENT, BARBARA RHOADS.

4 BARBARA RHOADS: I AM PARTICULARLY
5 CONCERNED ABOUT THE --

6 CURT SMITH: BARBARA, WOULD YOU PLEASE
7 COME FORWARD SO THE COURT REPORTER CAN GET IT? STATE
8 YOUR NAME AND WHO YOU REPRESENT. IF YOU WOULD COME UP
9 TO THE LEFT SO SHE CAN BE SURE TO HEAR YOU.

10 BARBARA RHOADS: I AM PARTICULARLY
11 CONCERNED ABOUT AGRICULTURE AND THE KIND OF IMPACT, AND
12 HOW MUCH IMPACT AGRICULTURE CAN STAND AND STILL EXIST.
13 I AM NOT -- I AM A HOUSEWIFE AND MY HUSBAND IS IN THE
14 SCHOOL BUSINESS. I HAVE SIX TOMATO PLANTS, BUT I AM A
15 CONSUMER AND I AM INTERESTED IN SEEING A LOT OF
16 COMPETITION.

17 IN OTHER WORDS, IF WE ELIMINATE THE
18 AGRICULTURAL AREAS -- SURE, THERE ARE OTHERS, BUT THAT
19 IN TURN COULD DRIVE UP THE PRICES AND JUST ELIMINATE
20 ONE MORE SECTION OF THE FOOD CHAIN. IN REGARDS TO
21 AGRICULTURE, PARTICULARLY THE WATER -- NOT JUST THE
22 PEOPLE THAT WOULD COME IN, BUT THE WATER, SAY WE HAD A
23 DROUGHT. WOULD A LARGE WEALTHY OIL COMPANY BE ABLE TO
24 COMMANDEER THE WATER? SAY IF WE -- HYPOTHETICALLY, IF
25 WE HAD ONE OF OUR LITTLE SKIRMISHES SOMEWHERE ELSE ON

(232)

1 THE GLOBE, THEY CAN SAY THIS IS A NATIONAL EMERGENCY
2 AND WE CAN TAKE THE WATER BECAUSE WE ARE MORE
3 IMPORTANT.

4 I THINK THEY OUGHT TO KNOW WHERE THE WATER
5 IS COMING FROM BEFORE WE ALLOW THEM TO LEASE IT. IN
6 OTHER WORDS, I UNDERSTAND THAT THE PEOPLE IN NORTH
7 DAKOTA TOLD THEM NO, THEY DIDN'T WANT TO SELL THEM
8 WATER, AND THEY WERE GOING TO PIPE IT DOWN. I HAVE
9 HEARD THINGS ABOUT THE MISSISSIPPI RIVER, BUT THAT'S
10 ALL FINE AND GOOD.

11 I WOULD LIKE TO KNOW FOR SURE WHERE THEY ARE
12 GOING TO GET IT. CERTAINLY WE DON'T HAVE ALL THE WATER
13 THEY NEED FOR THE OIL SHALE PROCESS HERE ON THE WESTERN
14 SLOPE. I DON'T THINK THAT IT'S, TO ME IT DOESN'T MAKE
15 GOOD SENSE TO GIVE THEM THE LAND BEFORE THEY KNOW WHERE
16 THE OTHER RESOURCES THAT THEY NEED ARE GOING TO COME
17 FROM.

18 IN PAONIA, ARCO HAD TO GUARANTEE THE FARMERS
19 THAT THE WATERSHED WOULD NOT BE SPOILED, BECAUSE THAT
20 WOULD RUIN THEIR LIVELIHOOD. I WOULD LIKE TO SEE THE
21 OIL COMPANIES DO SOMETHING OF THE SAME KIND OF DEAL
22 THAT THEY STRUCK WITH ARCO IN PAONIA.

23 THE LAST THING IS, IF WE DO THIS, I WOULD
24 HOPE THAT OUR ROYALTIES WOULD BE AT LEAST AS MUCH AS
25 COAL, IF NOT MORE. IT SEEMS LIKE THEY ARE WILLING TO

1 PAY THE ARABS AN EXORBITANT PRICE PER BARREL OF OIL. I
2 WOULD HOPE THEY FEEL THEIR FELLOW AMERICANS WOULD GET
3 SOMEWHAT OF A GOOD SHAKE. IT WOULD HELP THE ECONOMY ON
4 THE WESTERN SLOPE AND ALSO THEN, IT MIGHT OFFSET SOME
5 OF THE THINGS THAT THEY WOULD TAKE AWAY FROM US, SUCH
6 AS RECREATION AND GOOD AIR AND THAT KIND OF THING.
7 THAT'S ALL I HAVE TO SAY.

8 CURT SMITH: THANK YOU, BARBARA. DOTTIE
9 LAURITZEN?

10 DOTTIE LAURITZEN: I AM DOTTIE LAURITZEN
11 WITH THE LEAGUE OF WOMEN VOTERS. I HAVE PREPARED A
12 STATEMENT. THE LEAGUE OF WOMEN VOTERS OF THE GRAND
13 JUNCTION AREA ENDORSES THE NO ACTION ALTERNATIVE TO THE
14 PROPOSED ONE OR TWO PROTOTYPE OIL SHALE TRACTS
15 SUGGESTED IN THE PICEANCE BASIN. THE PURPOSE OF THE
16 PROTOTYPE LEASING WAS AND STILL IS TO DEVELOP
17 TECHNOLOGY AND TEST THE ENVIRONMENTAL PERIMETERS SUCH
18 AS AIR QUALITY, WATER AND SOIL.

19 PRIVATE OIL SHALE COMPANIES, SUCH AS UNION,
20 MOBIL, AND CHEVRON ARE PRESENTLY DEVELOPING OR PLANNING
21 TO DEVELOP THEIR OWN OPERATIONS. THUS THE IDEA OF
22 WAITING FOR PROTOTYPE DATA WOULD SEEM TO BE OF LITTLE
23 VALUE AS MILLIONS OF DOLLARS ARE BEING SPENT WEEKLY BY
24 INDUSTRY, WITHOUT THE USE OF PROTOTYPE INFORMATION.

25 WHY WOULD A CONSIDERATION OF NEW PROTOTYPES

1 BE CONSIDERED WHEN EXISTING LEASES ARE NOT COMPLETED
2 BUT, IN FACT, ARE ALL BUT CLOSED DOWN? TO ADD
3 ADDITIONAL PROTOTYPE LEASING WOULD FURTHER IMPACT AREAS
4 THAT HAVE NOT FULLY RECOVERED FROM EXXON. IT WOULD
5 ALSO REQUIRE ADDITIONAL PLANNING FOR FUTURE PRIVATE
6 DEVELOPMENT SUCH AS UNION, MOBIL AND CHEVRON, WHICH MAY
7 NOT BE APPROPRIATE AT THIS TIME.

8 OTHER ASPECTS OF SUCH A PLAN MUST ALSO BE
9 ADDRESSED, SUCH AS THE SOCIO-ECONOMIC CONCERNS WHICH
10 INVOLVE THE CUMULATIVE IMPACTS, BOTH DIRECT AND
11 INDIRECT, ON OUR CITIES AND TOWNS.

12 WITH GROWTH, THE PROBLEMS OF STAFFING AND
13 MAINTAINING LOCAL FIRE AND POLICE FORCES, PROVIDING
14 SOCIAL SERVICES, ADMINISTERING JUSTICE, CONSTRUCTING
15 ROADS, PROVIDING HOUSING, ESTABLISHING SCHOOLS AND
16 CHURCHES, TO NAME BUT A FEW, ARE LEFT FOR THE LOCAL
17 AGENCIES AND THE PEOPLE IN THESE COMMUNITIES TO DEAL
18 WITH. QUESTIONS ON HOW TO FUND THESE EXPANDED SERVICES
19 MIGHT SEVERELY TAX THE RESOURCES OF A SMALL TOWN OR A
20 SPARSELY POPULATED COUNTY.

21 IN MESA COUNTY, FOR INSTANCE, WHICH IS
22 FEELING SECONDARY IMPACTS, NEW BONDS WERE VOTED TO HELP
23 WITH THE NEED FOR SCHOOLS IN PROJECTED POPULATED AREAS.
24 NEW TAXES HAVE BEEN IMPOSED ON COMMUNITIES TO PAY FOR
25 ROADS AND RECREATIONAL AREAS THAT WILL BE NEEDED EVEN

1 MORE AS NEW GROWTH COMES IN FROM OIL SHALE PROJECTS.

2 THIS IS A GREAT CONCERN FOR ALL, BUT IS A
3 ADDED BURDEN FOR THOSE PEOPLE WHO ARE ON FIXED INCOMES.
4 BUT INDIVIDUALS ARE NOT THE ONLY GROUPS AFFECTED.

5 LOCAL SMALL BUSINESSES MAKE LONG-RANGE INVESTMENTS IN
6 BOTH EQUIPMENT AND MANPOWER, IN ANTICIPATION OF THE
7 ACCELERATED GROWTH ASSOCIATED WITH OIL SHALE. THESE
8 SAME SMALL BUSINESSES THAT DO SERVICES FOR THESE OIL
9 SHALE RELATED COMPANIES AT TIMES HAVE TO WAIT SIX TO
10 NINE MONTHS FOR THEIR MONEY AS THEY ARE PAID OUT OF
11 HOME OFFICES.

12 THE LEAGUE OF WOMEN VOTERS OF THE GRAND
13 JUNCTION AREA WOULD LIKE TO SEE SAFEGUARDS INCLUDED
14 ALONG WITH MITIGATING MEASURES IN THE E.I.S. THAT
15 WOULD INSURE SMALL BUSINESSES WOULD BE PROTECTED
16 AGAINST BEING LEFT WITH INCREASED INVENTORY, MEN AND
17 EQUIPMENT NEEDED FOR PROPOSED PROJECTS THAT COULD BE
18 STOPPED OR DISCONTINUED BEFORE BEING COMPLETED, SUCH AS
19 HAPPENED IN THE BOOM-BUST OF EXXON.

20 OF ALL THE IMPACTS, THE SOCIO-ECONOMIC
21 IMPACTS ARE OUR GREATEST CONCERN. OUR LAND USE AND ITS
22 DEVELOPMENT, WHETHER IT BE FOR LEASING WILDERNESS
23 AREAS, DEVELOPING TOWNS, FILLING AGRICULTURAL NEEDS,
24 SHOULD BE DONE IN A TIMELY AND ORDERLY MANNER, TAKING
25 INTO CONSIDERATION WATER AND AIR QUALITY, ECONOMIC

234

1 FACTORS, AND THE QUALITY OF LIFE IN AND AROUND THESE
2 LANDS.

3 ANOTHER PROBLEM MUST BE FACED AS WE FURTHER
4 DEVELOP OUR LANDS, WHETHER DIRECT OR SECONDARY. WE
5 TAKE UP FARM LANDS, GRAZING LANDS, AND AGRICULTURAL
6 LANDS. THE NEED FOR TOWNS AND NEW DEVELOPMENTS CAUSE
7 BOUNDARIES TO EXPAND FOR THE TOWNS AND THE COMMUNITY,
8 LEAVING THE FARMER AND FRUIT GROWER WITH INCREASING
9 PRESSURE AS TO WHETHER TO SELL THE LAND FOR HOUSING AND
10 FOR TRAILER TRACTS, OR TO BE CHALLENGED BY AN
11 UNDESIRABLE AREA.

12 THE LEAGUE OF WOMEN VOTE OF THE GRAND
13 JUNCTION AREA WOULD LIKE TO SUBMIT A FEW SUGGESTIONS
14 FOR THE FINAL E.I.S. TO BE INCLUDED IN THE PROTOTYPE
15 OIL SHALE LEASING PROGRAM. IT IS APPARENT THAT MUCH
16 TIME AND HARD WORK AND SINCERE WRITING HAS GONE INTO
17 THAT E.I.S. PROTOTYPE OIL SHALE PROGRAM PUBLICATION.
18 HOWEVER, THE LEAGUE WOULD LIKE TO SEE STILL FURTHER
19 IMPROVEMENTS MADE.

20 FIRST, MORE CLARIFICATION IS NEEDED IN MANY
21 INSTANCES. FOR EXAMPLE, LOOK AT THE QUOTE ON PAGE 159,
22 SECOND COLUMN, FIFTH PARAGRAPH. YOU CAN'T READ IT.

23 IT IS NOT ALWAYS AN EASY DOCUMENT TO
24 INTERPRET. IF SUCH AMBIGUOUS STATEMENTS COULD BE
25 DELETED OR BE WRITTEN CLEARLY, IT WOULD HELP IN

1 EXPLAINING WHAT THE IMPACTS REALLY ARE.

2 THE LEAGUR IS ALSO CONCERNED AS TO HOW THIS
3 PROTOTYPE E.I.S. QUANTIFIES THE REAL GROWTH, IMPACTS,
4 AND QUALITY OF LIFE. CHANGES. THIS DRAFT SPEAKS OF
5 GROWTH IMPACTS BY NUMBERS AND SCENARIOS BOTH HIGH AND
6 LOW ON POPULATION, BUT DOES NOT SPEAK TO THE REAL
7 IMPACTS SUCH AS THE NEEDS FOR HOUSING, SCHOOLS, ROADS,
8 SECONDARY WORKERS, POLICE, FIREMEN, ET CETERA.

(130)

9 WHAT ABOUT THE NEED FOR WATER TREATMENT,
10 SEWAGE DISPOSAL, HOSPITALS, AND SCHOOLS? HOW ARE THESE
11 SERVICES TO BE FUNDED? ALSO HOW IS THE HUMAN ELEMENT
12 TO BE TAKEN CARE OF, SUCH AS THE PROBLEM OF FIXED
13 INCOME PEOPLE, DISPLACED PEOPLE, ENVIRONMENTAL QUALITY,
14 RECREATIONAL AND EDUCATIONAL NEEDS?

(124)

15 THE LEAGUE REALIZES THAT WITH ALL GROWTH
16 THERE ARE PLUSES AS WELL AS MINUSES. THE LEAGUE IS
17 SUPPORTIVE OF BLM AND COMMENDS THE EFFORTS IT IS MAKING
18 TO SEE THAT THIS STATEMENT IS REVIEWED AND THAT THE
19 PUBLIC IS GIVEN AN OPPORTUNITY FOR INPUT. THE LEAGUE
20 IS NOT SAYING THAT THERE SHOULD BE NO GROWTH IN WESTERN
21 COLORADO DUE TO OIL SHALE. IT IS SAYING GROWTH SHOULD
22 BE PLANNED IN ASSOCIATION WITH VIABLE OIL SHALE
23 PROJECTS, AND ANOTHER PROTOTYPE PROGRAM DOES NOT SEEM
24 NECESSARY AT THIS TIME.

25 CURT SMITH: THANK YOU, DOTTIE. RUSS

1. The first part of the report is a general introduction to the subject of the study. It discusses the importance of the study and the objectives of the research. It also provides a brief overview of the methodology used in the study.

2. The second part of the report is a detailed description of the study area. It includes information about the location of the study area, the population of the study area, and the characteristics of the study area. It also discusses the data sources used in the study.

3. The third part of the report is a detailed description of the study results. It includes information about the findings of the study, the conclusions drawn from the findings, and the implications of the findings. It also discusses the limitations of the study and the need for further research.

4. The fourth part of the report is a conclusion and recommendations section. It summarizes the main findings of the study and provides recommendations for future research and policy. It also discusses the overall impact of the study and the need for further research.

1 ARENSMAN?

2 RUSS ARENSMAN: GOOD EVENING. MY NAME
3 IS RUSS ARENSMAN. I AM THE WESTERN SLOPE ORGANIZER FOR
4 A GROUP CALLED COLORADANS FOR RECYCLING. I AM ALSO A
5 MEMBER OF THE WESTERN COLORADO CONGRESS.

6 THE MAIN REASON I AM HERE TONIGHT AND THE
7 MAIN QUESTION I WOULD LIKE TO ASK IS, WHY MORE LEASES? } (16)
8 AT THIS POINT WE HAVE SEEN TWO LEASES THAT HAVE ALREADY
9 BEEN GRANTED. WE HAVE SEEN VERY LIMITED SUCCESS IN THE
10 OPERATIONS AT EITHER OF THOSE PLACES. YET DURING THE
11 COURSE OF THE DEVELOPMENT THAT HAS TAKEN PLACE AT EACH
12 OF THOSE LEASES, WE HAVE SEEN EXTENSIVE IMPACTS ON THE
13 AREA OF THE PICEANCE BASIN AND THE AREA OF RIFLE,
14 PARACHUTE, GRAND JUNCTION.

15 MY QUESTION IS, WE ALREADY HAVE SEVERAL.
16 THEY ARE APPARENTLY NOT WORKING OUT VERY WELL. WE HAVE
17 THE ENTIRE PICEANCE BASIN CRISS-CROSSED AND DOTTED WITH
18 PRIVATE LEASE HOLDINGS, OR PRIVATE LAND HOLDINGS BY
19 ENERGY COMPANIES. AT THIS POINT, THE ONLY COMPANY
20 DOING ANY KIND OF SERIOUS DEVELOPMENT IS UNION OIL
21 SHALE. THEIR PROJECT HAS BEEN ON GOING FOR SEVERAL
22 YEARS.

23 WHY, I WANT TO KNOW -- IT JUST DOESN'T MAKE
24 SENSE TO ME AT THIS PARTICULAR POINT IN TIME WHY WE
25 NEED TO MAKE MORE LEASES AVAILABLE. IT SORT OF REMINDS

1 ME OF SAY AN AUTOMOBILE MANUFACTURER WHO UPON FINDING
2 OUT THE PEOPLE ARE NOT BUYING HIS CARS, TURNS AROUND
3 AND MAKES TWICE AS MANY MORE CARS JUST TO SEE IF
4 SOMEBODY BY CHANCE WILL BUY THE SECOND ONES. IT JUST
5 DOESN'T MAKE SENSE.

6 WHAT I WOULD LIKE TO SEE INCLUDED IN THIS
7 ENVIRONMENTAL IMPACT STATEMENT THAT IS BEING PREPARED
8 IS SOMETHING THAT ADDRESSES THE ENERGY ALTERNATIVES
9 THAT WE HAVE HERE. THE ORGANIZATION I AM WORKING FOR
10 AT THIS POINT IS PROMOTING A BILL THAT WOULD REQUIRE
11 BOTTLES AND CANS TO BE RECYCLED IN THIS STATE. A VERY
12 SMALL MEASURE WOULD PUT A NICKEL DEPOSIT ON EACH BOTTLE
13 AND CAN, YET STUDIES BY GOVERNOR LAMM'S OFFICE SHOW
14 THAT ENOUGH ENERGY WOULD BE SAVED BY THIS ONE SIMPLE
15 MEASURE TO HEAT THE HOMES OF 50,000 PEOPLE IN THE STATE
16 OF COLORADO WITH THE ENERGY SAVED. THAT'S ONE SMALL
17 THING.

18 WE HAVE SOLAR ENERGY DEVELOPMENT THAT IS
19 BEING IGNORED AND SHUNTED ASIDE BY THE FEDERAL
20 GOVERNMENT RIGHT NOW. I SIMPLY SEE NO REASON OR
21 PURPOSE FOR THE TIMING OF GRANTING ADDITIONAL LEASES.

22 ANOTHER THING I WOULD LIKE TO SEE INCLUDED
23 IN THIS IS A COST-BENEFIT ANALYSIS THAT IS GOING TO IN
24 SOME WAY ADDRESS HOW MUCH THIS IS GOING TO COST US, THE
25 TAXPAYERS, AND WHAT WE ARE GOING TO GET OUT OF IT.

} (8)

} (155)

1 BASICALLY I AM AGAINST GRANTING ANY MORE
2 LEASES. HOWEVER, I FEEL IF MORE LEASES MUST BE
3 GRANTED, IF JAMES WATT FEELS SO MOVED THAT HE WOULD
4 IGNORE MASSIVE PUBLIC SENTIMENT AGAINST GRANTING MORE
5 LEASES, THEN SEVERAL THINGS SHOULD BE ADDRESSED. FIRST
6 OF ALL, THE SOCIO-ECONOMICS OF THIS WHOLE PROPOSAL.

7 FOR THE LAST YEAR BEFORE MOVING TO GRAND
8 JUNCTION, I WAS A RESIDENT OF RIFLE, COLORADO. I CAN
9 TELL YOU LAST SUMMER DURING THE HEIGHT OF WHEN C-A AND
10 C-B WERE STILL IN OPERATION, YOU COULD HARDLY GET
11 ACROSS RAILROAD AVENUE. THERE ARE INADEQUATE PUBLIC
12 FACILITIES IN TERMS OF STREETS, WATER, POLICE, SEWER,
13 FIRE, AND AMBULANCE IN THE WHOLE REGION. AS FAR AS I
14 CAN SEE, ONLY A MAKESHIFT ATTEMPT AT TRYING TO PROVIDE
15 THOSE SERVICES IN THE AMOUNTS THAT WOULD BE REQUIRED TO
16 ACCOMMODATE THE MASSIVE INFUX OF PEOPLE THAT WOULD BE,
17 SHOULD OIL SHALE DEVELOPMENT REALLY KICK OFF AND
18 GETTING, THAT WOULD BE REQUIRED.

19 FURTHERMORE, WILDLIFE, WE HAVE THE LARGEST
20 HERD OF MULE DEER IN THE WORLD UP IN THE PICEANCE
21 BASIN. WE HAVE SEEN THEIR POPULATION DECREASE
22 DRASTICALLY YEAR AFTER YEAR NOW. WHAT IS THIS GOING TO
23 DO TO MAKE THAT ANY BETTER?

24 FINALLY, I WOULD LIKE TO SEE PROVISIONS
25 INCLUDED IN THIS, IF MORE LEASES ARE GRANTED, THAT

1 WOULD PREVENT AGAINST CONTAMINATION OF THE WATER THAT
2 IS IN THE AREA, AND ALSO PROTECT THE RIGHTS OF USAGE
3 THAT ARE ALREADY EXISTING FOR THE PEOPLE IN THE AREA.
4 THE SAME THING FOR THE AIR QUALITY. I DON'T WANT TO
5 SEE WESTERN COLORADO, THE PLACE THAT IS MY HOME, USED
6 AS A TESTING GROUND FOR OIL SHALE DEVELOPMENT WITHOUT
7 SOME KIND OF PROVISIONS TO PROTECT THE EXISTING PEOPLE
8 AND THE ENVIRONMENT THAT ARE HERE RIGHT NOW.

9 CURT SMITH: THANK YOU, RUSS. KATE
10 HOLMES?

11 KATE HOLMES: MY NAME IS KATE HOLMES. I
12 AM A RESIDENT OF FRUITA. I AM ALSO A MEMBER OF THE TWO
13 RIVERS CITIZENS ASSOCIATION.

14 MY PRIMARY CONCERN TONIGHT IS THE
15 PRESERVATION OF CLEAN AIR IN WESTERN COLORADO, AND THE
16 CUMULATIVE ADVERSE EFFECTS THE PROPOSED FEDERAL OIL
17 SHALE LEASES COULD HAVE WHEN ADDED TO THE MARGINAL AIR
18 QUALITY ALREADY DOCUMENTED AND ATTRIBUTED TO EXISTING
19 AND PREDICTED NEARBY OIL SHALE DEVELOPMENT.

20 I MOST STRONGLY SUPPORT THE NO ACTION
21 ALTERNATIVE IN THE E.I.S., BUT AT LEAST WOULD URGE A
22 DELAY IN THE PROPOSAL FOR ADDITIONAL LEASES UNTIL THE
23 RESOURCE MANAGEMENT PLAN IS IN PLACE, AND MORE THOROUGH
24 INVESTIGATION OF ENVIRONMENTAL IMPACTS HAS BEEN DONE.

25 THE E.I.S. IN ITS IMPACT ANALYSES REPEATEDLY

POINTS OUT THAT NEW OIL SHALE DEVELOPMENT WOULD POSE
SIGNIFICANT THREATS TO THE PRESERVATION OF FEDERAL AND
STATE AIR QUALITY STANDARDS, BOTH IN NEARBY COMMUNITIES
LIKE RIFLE AND MEEKER AND ALSO IN TWO ENVIRONMENTALLY
SENSITIVE, WILDERNESS AREAS, MT. ZIRKEL AND THE FLAT
TOPS.

THERE ARE AIR QUALITY PROBLEMS DESCRIBED IN
ALL THREE PROPOSED ALTERNATIVES. IN THE NO ACTION
ALTERNATIVE, IT IS PREDICTED THAT THE PRIVATE OIL SHALE
DEVELOPMENT ALONE WHICH IS PLANNED FOR THE AREA WEST OF
RIFLE WOULD PROBABLY CREATE SIGNIFICANT VIOLATIONS FOR
TOTAL SUSPENDED PARTICULATES, SULPHUR DIOXIDES AND
NITROGEN OXIDES. THERE WOULD BE ASSOCIATED VIOLATIONS
IN THE MR. ZIRKEL AND BOOKCLIFFS AREA. IF PRIVATE
DEVELOPMENT WILL PUSH THE AREA INTO THE DANGER ZONE FOR
AIR QUALITY, WHY SHOULD THE GOVERNMENT PROCEED WITH
PROJECTS WHICH WOULD ONLY AGGRAVATE THE SITUATION?

TAKING THE C-11 AND/OR C-18 ALTERNATIVES,
THE SAME PROBLEMS DISCUSSED ABOVE PREVAIL, ONLY TO A
GREATER EXTENT. BUT IN ADDITION, POLLUTANTS WOULD
REACH THE FLAT TOPS WILDERNESS AREA WHICH, LIKE MT.
ZIRKEL, CARRIES THE EPA CLASS ONE DESIGNATION, MEANING
THAT ANY DETERIORATION IS SEEN AS SIGNIFICANT. THE
IMPACT IN THE FLAT TOPS WOULD BE LARGELY IN THE FORM OF
LAKE CONTAMINATION CAUSED BY ACID RAIN WHICH IS

1 PRODUCED IN PART BY COMBUSTION PRODUCTS OF OIL SHALE
2 RETORTING.

3 ACID RAIN HAS ALREADY BEEN DOCUMENTED IN
4 THIS AREA BY THE ROCKY MOUNTAIN BIOLOGICAL LAB, AND
5 THUS IS AN EXISTING PROBLEM. WITH LAKE CONTAMINATION
6 COME THREATS TO THE FISH LIFE, THE LIFE OF THE LAKES
7 THEMSELVES AND FINALLY THE TOURIST ATTRACTION VALUE OF
8 THE AREA.

9 NOW TO A MORE IMMEDIATE CONCERN, THE AIR
10 QUALITY OF THE GRAND VALLEY. EVEN THOUGH A BIT REMOVED
11 FROM THE PROPOSED LEASES, OUR LIVES WOULD NOT GO
12 UNAFFECTED. BECAUSE IT IS THE NEAREST LARGE URBANIZED
13 AREA, GRAND JUNCTION AND THE GRAND VALLEY IN GENERAL
14 WOULD MOST LIKELY BE THE COORDINATING CENTER FOR ANY
15 SHALE INDUSTRY OF THE SIZE PREDICTED BY THE PROTOTYPE
16 PROGRAM. WITH GROWTH OF THE INDUSTRY COME INCREASED
17 POPULATION, INCREASED TRANSPORTATION ROUTES AND USE
18 THEREOF, AND THE DEVELOPMENT OF SECONDARY INDUSTRIES
19 AND PUBLIC SERVICES LIKE POWER PLANTS, ALL OF WHICH
20 AFFECT AIR QUALITY.

21 THE GRAND VALLEY IS ALREADY IN TROUBLE WITH
22 ITS NON-ATTAINMENT AREA AIR QUALITY STATUS. WE VIOLATE
23 THE FEDERAL STANDARDS FOR PARTICULATES. THOSE OF US
24 LIVING HERE ARE ALL TOO AWARE OF THE EVIDENCE OF THE
25 DETERIORATING AIR QUALITY. WE COUGH AND OUR EYES WATER

1 FROM EXHAUST FUMES AND THE DUST. OUR NOSES ARE
2 INCREASINGLY ASSAULTED BY THE SMELLS FROM INDUSTRIAL
3 AND VEHICULAR FUMES. FOR EXAMPLE, AS A RESIDENT OF
4 FRUITA, I AM BLASTED ALMOST EVERY MORNING AND EVENING
5 WITH THE HEAVY, KASTY SNEEL OF HYDROCARBONS AND SULPHUR
6 COMING FROM THE LOCAL REFINERY.

7 ALL OF THESE PROBLEMS WILL BE COMPOUNDED
8 WITH DEVELOPMENT IF PLANNING AND SURVEILLANCE ARE NOT
9 PRUDENT. TWO LARGE PROJECTS WHICH STAND TO GREATLY
10 EFFECT THE AREA'S AIR QUALITY ARE ALREADY PROPOSED:
11 THE COLORADO-UTE COAL-FIRED PLANT IN HACK AND THE
12 CHEVRON REFINERY IN FRUITA, WHICH WILL BE EIGHT TIMES
13 THE SIZE OF GARY REFINING

14 THE E.I.S. ACKNOWLEDGES THE UNAVOIDABLE
15 IMPACTS THAT THE PROTYPE LEASES AND SECONDARY SOURCES
16 WOULD HAVE. HOWEVER, THE BLM REASONS THAT SINCE ALL OF
17 THE VIOLATIONS WILL OCCUR ANYWAY, DUE TO PRIVATE
18 SOURCES ALONE AND SINCE THE PROTOTYPE LEASES WOULD
19 OPERATE WELL WITHIN STANDARDS AND WOULD NOT CONTRIBUTE
20 TO THE VIOLATIONS, THAT THEIR EMISSIONS WOULD NOT
21 CONTRIBUTE TO THE DETERIORATION OF THE GENERAL AIR POOL
22 IN WESTERN COLORADO. BLM'S REASONING WOULD HAVE US
23 BELIEVE TO THE THAT THE AIR POLLUTION GENERATED ON THE
24 PROTOTYPE SITES WOULD STAY RIGHT THERE AND WOULD NOT
25 TRAVEL AND THUS ADD TO THE CONCENTRATIONS IN

1 SURROUNDING AREAS. EVEN IF THEIR PROJECTS ARE KEPT
2 INDIVIDUALLY WITHIN STANDARDS, THEY WILL CERTAINLY ADD
3 TO THE GENERAL POLLUTION.

4 DEVELOPMENT AND GROWTH ARE INEVITABLE, I
5 KNOW. I JUST REPEAT MY APPEAL FOR PRUDENT PLANNING AND
6 IN THE CASE OF THE PROTOTYPE LEASING, IT WOULD SEEM TO
7 BE MORE LOGICAL TO WAIT UNTIL THE RESOURCE MANAGEMENT
8 PLAN FOR THE AREA IS DONE, BY WHICH TIME MORE MAY BE
9 KNOWN ABOUT THE TYPES AND SEVERITY OF IMPACTS FROM
10 PRIVATE OIL SHALE DEVELOPMENT AND SECONDARY SOURCES.

11 WE MUST NOT FORGET THAT OUR CLEAN AIR IS A
12 FRAGILE AND VULNERABLE THING. IT IS IN SOME WAYS A
13 NON-RENEWABLE RESOURCE. LEST WE THINK THAT THE AIR
14 POLLUTION ASSOCIATED WITH THE OIL SHALE INDUSTRY WOULD
15 END WITH THE CLOSING OF THE MINES, CONSIDER THE FACT,
16 AS THE E.I.S. DOES, THAT THERE WOULD BE PERMANENT
17 DAMAGE INCURRED IN THE AREA BECAUSE OF THE REGIONAL
18 DEVELOPMENT WHICH WOULD HAVE TAKEN PLACE, NOT TO
19 MENTION THE UNKNOWN CUMULATIVE IMPACTS TO VEGETABLE,
20 ANIMAL AND HUMAN HEALTH.

21 CURT SMITH: THANK YOU, KATE. JIM
22 MORRIS?

23 JIM MORRIS: I DON'T WANT TO COMMENT
24 TONIGHT, THANK YOU.

25 CURT SMITH: LOUISE NOYES?

LOUISE ROYES: I WOULD LIKE TO THAT YOU
FOR THIS OPPORTUNITY TO SPEAK. I AM REPRESENTING THE
ASPEN WILDERNESS WORKSHOP TONIGHT. THAT GROUP IS ALSO
A MEMBER OF THE WESTERN COLORADO CONGRESS. I WAS GOING
TO ADDRESS A LOT OF THE AIR QUALITY ISSUES ALSO. SINCE
IT WAS JUST DONE SO ADMIRABLY, I WON'T DO THAT.

I WOULD LIKE TO SAY THAT THE DRAFT E.I.S.
APPEARS TO BE A VERY SOLID DOCUMENT. YOU SHOULD BE
CONGRATULATED FOR THAT. THE SCOPE COULD HAVE BEEN A
LITTLE MORE BROAD AND WE WOULD HAVE THOUGHT YOU WOULD
BETTER ADDRESS THE SERIOUS CONFUSION OF DOING THE DRAFT
E.I.S. AND THE FINAL E.I.S. BEFORE A RESOURCE
MANAGEMENT PLAN IS IN EFFECT. I WILL SKIP OVER MOST OF
WHAT I WAS GOING TO SAY BECAUSE IT WOULD BE JUST
DUPLICATION.

ONE OTHER SERIOUS FLAW I WANTED TO BRING UP
ABOUT THE LEASING SCENARIO IS THE FACT THAT ONLY 20
PERCENT OF THE RESOURCE WILL BE RECOVERED USING THE
CURRENTLY AVAILABLE TECHNOLOGIES. THIS SEEMS LIKE A
TERRIBLE WASTE OF NATIONAL ASSETS.

IT'S A TWO-SIDED WASTE. IT'S A WASTE OF THE
MINERAL ASSETS AND THE INTANGIBLE ASSETS LIKE CLEAN
AIR, CLEAN WATER AND THE UNDEVELOPED RANGELANDS. IT IS
ILLOGICAL AND SENSELESS TO GO AHEAD WITH THE LEASING
UNTIL IT IS POSSIBLE TO RECOVER MORE OF THE OIL FROM

1 NO LEASING ALTERNATIVE. WE WOULD GO ON RECORD AS
2 HAVING THE LEAST OBJECTIONS TO LEASING ONLY TRACT C-18
3 IF THAT'S WHAT WOULD HAVE TO BE DONE, AND THAT'S ONLY
4 AFTER THE R.M.P. IS COMPLETE. THIS SHOULD BE FOR
5 MAXIMUM MULTIPLE MINERAL RECOVERY, AND THE LEASE SHOULD
6 HAVE A PROVISION REQUIRING THAT, AS WELL AS ROYALTY
7 REQUIREMENTS. (29)

8 SECTION EIGHT OF THE OIL SHALE LEASE
9 ENVIRONMENTAL STIPULATIONS ADDRESSES THE AIR POLLUTION,
10 AND IT SHOULD CONTAIN SPECIFIC LANGUAGE TO DEFINE THE
11 COMPANIES' RESPONSIBILITIES AFTER SHUTDOWN, EVEN IF
12 THAT SHUTDOWN IS PREMATURE, NOT JUST DURING
13 CONSTRUCTION AND OPERATION AS THE WORDING IS NOW. (20)

14 AGAIN I THANK YOU FOR THIS OPPORTUNITY TO
15 MAKE COMMENTS.

16 CURT SMITH: THANK YOU, LOUISE. JEANIE
17 HEMPHILL?

18 JEANIE HEMPHILL: GOOD EVENING. MY NAME
19 IS JEANIE HEMPHILL. AS A NEWCOMER TO NORTHWEST
20 COLORADO BUT NOT A NEWCOMER TO COLORADO, I INITIALLY
21 HESITATED TO COMMENT ON ANYTHING AS FORMIDABLE AS THE
22 BUREAU OF LAND MANAGEMENT'S PROTOTYPE OIL SHALE LEASING
23 ENVIRONMENTAL IMPACT STATEMENT. JUST THE NAME WAS
24 OVERWHELMING. HOWEVER, THIS IS ALL THE MORE REASON
25 THAT I, A LOW-INCOME CONCERNED COLORADO TAXPAYER AND

1 RESIDENT, OUGHT TO SPEAK OUT TONIGHT.

2 THE FUTURE OF OIL SHALE IN THE PICEANCE
3 BASIN OF COLORADO WILL IN FACT AFFECT ME. IT ALREADY
4 HAS AND IT WILL CONTINUE TO DO SO. HOWEVER, I WOULD
5 LIKE TO SEE OIL SHALE'S IMPACT ON MY LIFE CAREFULLY
6 CONTROLLED. I LIVE IN COLORADO BY CHOICE, NOT
7 ACCIDENT, BECAUSE OF COLORADO'S WILD OPEN SPACES, CLEAN
8 AIR AND WATER, BEAUTIFUL DESERT AND MOUNTAIN COUNTRY,
9 SMALL TOWNS, ET CETERA. I HAVE BEEN IN COLORADO LONG
10 ENOUGH TO SEE UPS AND DOWNS AND CHANGES IN QUALITY OF
11 LIFE.

12 IN MY OPINION, AT THIS TIME MORE OIL SHALE
13 LEASING WILL NOT IMPROVE MOST OF OUR LIVES. QUITE THE
14 OPPOSITE. IN MY CASE, THE AREAS I HIKE FOR RECREATION
15 STAND TO BE ERODED IN SIZE AND QUALITY. THE WILDLIFE I
16 ENJOY WILL BE PRESSURED, AND THE BOOM CYCLE WILL BRING
17 HOUSING AND FOOD COSTS WHICH I CAN NOT AFFORD. MORE TO
18 THE POINT, HOWEVER, IS THE FACT THAT CURRENT OIL SHALE } (10)
19 PROCESSES ARE INTENSELY ENERGY CONSUMPTIVE, RESULTING
20 IN A QUESTIONABLE GAIN OF ENERGY. IS IT EVEN POSSIBLE
21 THAT WE TAKE SERIOUSLY SUCH AN INDUSTRY IN THIS DAY AND
22 AGE OF ENERGY AWARENESS AND CONSERVATION? THIS IS NOT
23 TO MENTION THE PRESENT ECONOMIC INFEASIBILITY OF OIL } (16)
24 SHALE, THE PROBLEM OF INCOMPLETE MINERALS RECOVERY AND
25 RECLAMATION DIFFICULTIES, ET CETERA.

1 UNTIL BETTER TECHNOLOGY DEVELOPS AND
2 ECONOMICS BECOME MORE FAVORABLE TO THE AVERAGE PERSON,
3 I URGE NO FURTHER LEASING OF BLM LANDS FOR OIL SHALE AT
4 THIS TIME. THANK YOU FOR THIS OPPORTUNITY TO COMMENT.

5 CURT SMITH: THANK YOU, JEANIE. BOB
6 THOMASON?

7 BOB THOMASON: MY NAME IS BOB THOMASON.
8 I REPRESENT CATHEDRAL BLUFFS OIL SHALE COMPANY, THE
9 LESSEE OF TRACT C-B. I AM PLEASED TO SAY THAT
10 CATHEDRAL BLUFFS SUPPORTS THE CONTINUED DEVELOPMENT OF
11 SHALE OIL, OF THE SHALE OIL INDUSTRY AND ITS
12 TECHNOLOGY. I AM ALSO PLEASED TO SAY THAT WE FEEL WE
13 SHOULD PROCEED WITH DEVELOPING THE MECHANICS OF LEASING
14 SO THAT THOSE MECHANICS CAN BE IN PLACE WHEN THE DEMAND
15 FOR THE INDUSTRY REALLY STARTS TO ROLL FORWARD SO THAT
16 IT MAY DO SO IN A TIMELY WAY.

17 I AM GOING TO SUBMIT COMMENTS IN WRITING AT
18 A LATER DATE, BUT I WOULD LIKE TO SAY A COUPLE OF
19 THINGS ABOUT THE BASIS FOR THOSE COMMENTS. FIRSTLY, WE
20 ARE CONCERNED ABOUT THE BASIS AND THE ASSUMPTIONS THAT
21 GIVE RISE TO THE PREDICTIONS THAT ARE MADE IN THE AIR
22 QUALITY SECTION OF THE DRAFT E.I.S. WE FEEL THAT THAT
23 BASIS NEEDS TO BE MORE CLEARLY PROVIDED SO THAT WE CAN
24 SEE THAT THE ASSUMPTIONS MIGHT BE REALLY DRAWN OUT OF
25 PROPORTION HERE.

1 I AM ALSO CONCERNED ABOUT THE BASIS AND
2 ASSUMPTIONS THAT WERE MADE FOR THE HYDROLOGY
3 PREDICTIONS. WE FEEL THAT THAT BASIS AND ASSUMPTION
4 MAINLY COMES OUT OF OLD INFORMATION THAT HAS NOT BEEN
5 VALIDATED, AND ALSO THAT THERE IS NO INFORMATION THAT
6 SHOWS US THAT THE TWO AQUIFER SYSTEM IS FAR MORE
7 COMPLEX THAN THAT, AND THAT THE IMPACTS WOULD BE MUCH
8 REDUCED ON THE BASIS OF OUR CURRENT KNOWLEDGE, WHICH IS
9 BASED ON DATA RATHER THAN EARLY PREDICTIONS AND
10 ASSUMPTIONS MADE WITHOUT REAL DATA.

11 AS I MENTIONED, PREVIOUSLY, OUR COMMENTS
12 WILL BE SENT TO YOU IN WRITING BEFORE THE END OF THE
13 COMMENT PERIOD IS OVER WITH.

14 CURT SMITH: THANK YOU, BOB. DANIEL
15 HALE.

16 DAN HALE: MY NAME IS DAN HALE. I AM
17 GENERAL COUNSEL FOR OCCIDENTAL OIL SHALE. MY COMMENTS
18 TONIGHT ARE GOING TO BE VERY BRIEF.

19 THE FIRST COMMENT IS, I WOULD LIKE TO SEE
20 BOTH THE IS E.I.S. IMPACT STATEMENT AND THE RESOURCE
21 MANAGEMENT PLAN TAKE INTO ACCOUNT IN ADDITION TO THE
22 LEASES AND THE PRIVATE DEVELOPMENTS THAT THEY HAVE
23 LOOKED AT ALSO, THE COLORADO ^{IN LIEU} ~~LOWLAND~~ SELECTIONS. THIS
24 IS A VERY SERIOUS SELECTION BY THE STATE OF COLORADO IN
25 ORDER THAT THEY MIGHT JOIN IN AND PARTICIPATE IN THE

1 L SHALE DEVELOPMENT, AND IT SHOULD NOT BE SUMMARILY
2 SHUNTED ASIDE, BASED UPON FEELINGS THAT THE BLM MIGHT
3 HAVE REGARDING THE VALIDITY OF THAT SELECTION.

4 SECONDLY, I CAN'T HELP BUT FEEL THAT WE HAVE
5 HEARD SOME EXTREMELY CONCERNED AND THOUGHTFUL COMMENTS
6 TONIGHT. THEY ARE VERY APPROPRIATE. BUT I HOPE THAT
7 YOU PAY VERY CAREFUL ATTENTION TO MR. THOMASON'S
8 COMMENTS REGARDING THE FACTUAL BASIS THAT THOSE
9 COMMENTS HAD, BASED ON THE DRAFT E.I.S.. WE THINK
10 THERE'S A WHOLE LOT OF BETTER, NEWER AND MORE
11 SCIENTIFIC DATA THAN WAS USED IN THAT E.I.S., WHICH HAS
12 CAUSED PERHAPS AN UNDUE AMOUNT OF CONCERN. THANK YOU
13 VERY MUCH.

14 CURT SMITH: THANK YOU, DAN. RAY
15 GRONWALL?

16 RAY GRONWALL: I WILL RESPOND AT A LATER
17 DATE IN WRITING.

18 CURT SMITH: JUDY MOFFATT?

19 JUDY MOFFATT: I AM JUDY MOFFATT,
20 SPEAKING FOR THE GARFIELD-EAGLE COUNTY LEAGUE OF WOMEN
21 VOTERS. ALONG WITH THE STATE LEAGUE OF WOMEN VOTERS,
22 WE SUPPORT THE NO ACTION ALTERNATIVE. CONCERNS ABOUT
23 SOCIO-ECONOMIC IMPACTS FOR RIFLE AND GARFIELD COUNTY
24 ARE MAJOR REASON FOR OUR SUPPORTING THE NO ACTION
25 ALTERNATIVE.

1 THE DRAFT E.I.S. SUMS IT UP VERY WELL.
2 PARACHUTE, BATTLEMENT MESA, RIFLE, MEEKER AND POSSIBLY
3 OTHER COMMUNITIES MAY BE HEAVILY IMPACTED BY OIL SHALE
4 AND OTHER MINERAL DEVELOPMENTS ASSUMED IN THE NO ACTION
5 ALTERNATIVE, DEPENDING ON THE COURSE OF EVENTS. IF
6 THAT HAPPENS, EVEN MODERATE IMPACTS FROM THESE
7 ALTERNATIVES, THE NEW LEASES, WOULD HAVE SERIOUS
8 CONSEQUENCES WHEN COMMUNITY RESOURCES ARE ALREADY
9 STRETCHED TO THEIR LIMITS.

10 THE DRAFT E.I.S. EXPLAINS THAT RIFLE IS
11 EXPECTED TO GROW AT AN ANNUAL AVERAGE COMPOUNDED RATE
12 OF ABOUT TEN PERCENT, EVEN WITHOUT ADDED PROTOTYPE
13 LEASING. IT PROJECTS A LOW GROWTH RATE OF 19 PERCENT
14 FOR ONE TRACT BY 1988, WITH A HIGH SCENARIO ESTIMATE OF
15 28 PERCENT; AND FOR BOTH TRACTS GROWTH COULD BE AS LOW
16 AS 45 PERCENT OR AS HIGH AS 63 PERCENT.

17 THE SUMMARY STATES THIS RANGE OF POPULATION
18 INCREASE COULD CREATE VERY SEVERE SOCIAL STRUCTURAL
19 BREAKDOWNS FOR THE COMMUNITY. THE GARFIELD-EAGLE
20 COUNTY LEAGUE FEELS THIS GROWTH RATE WOULD BE
21 UNACCEPTABLE AND WOULD CREATE INTOLERABLE AND
22 UNNECESSARY STRESSES AND PROBLEMS FOR CURRENT
23 RESIDENTS.

24 THE LEAGUE ALSO HAS SERIOUS CONCERNS ABOUT
25 THE PROJECTED AIR QUALITY IMPACT. ACCORDING TO THE

124

1 DRAFT E.I.S., RIFLE CAN EXPECT AIR QUALITY VIOLATIONS
2 FOR TSP, SULPHUR DIOXIDE AND NITROGEN OXIDES BY THE
3 YEAR 2003, JUST FROM THE EXISTING OIL SHALE DEVELOPMENT
4 ON PRIVATE LANDS. IT IS PREDICTED THAT NITROGEN OXIDES
5 WILL BE 41 TIMES THE ANNUAL AVERAGE PRIMARY HEALTH
6 STANDARD. THE E.I.S. CONCLUDES THAT THESE VIOLATIONS
7 COULD POSE SIGNIFICANT HEALTH PROBLEMS FOR THE
8 POPULATION OF RIFLE IF DEVELOPMENT OCCURS AS PREDICTED.

9 THE LEAGUE BELIEVES THERE MUST BE SOME AIR
10 QUALITY ASSURANCES BUILT INTO ANY NEW LEASING PROCESS } (20)
11 FROM THE START. AFTER OBTAINING ITS LEASE, RIO BLANCO
12 OIL SHALE HAS SOUGHT CHANGES IN THE MINERAL LEASING ACT
13 TO ALLOW IT TO DISPOSE OFF TRACT. NO LEASES SHOULD BE
14 GRANTED IF IT WILL IN FACT MEAN VIOLATIONS OF THE
15 CURRENT NATIONAL AMBIENT AIR QUALITY STANDARDS AND THE } (1)
16 P.S.D. INCREMENTS. WE SHOULD AVOID ANOTHER RIO BLANCO
17 TYPE SITUATION WHERE AFTER A LEASE HAS BEEN GRANTED THE
18 LEASE HOLDER CAN SAY, YOU GAVE ME MY LEASE, NOW YOU
19 HAVE TO RELAX STANDARDS TO ALLOW ME TO USE IT.

20 IF BLE DECIDE IT MUST LEASE, WE STRONGLY
21 URGE THAT ONLY ONE TRACT BE LEASED. WE UNDERSTAND THE
22 INTENT OF MORE LEASING WOULD BE TO TEST THE FEASIBILITY
23 OF MULTIMINERAL EXTRACTION. THIS CAN BE ADEQUATELY
24 TESTED ON ONE TRACT. LEASING TWO TRACTS, MUCH MORE
25 THAN DOUBLES IMPACTS, ESPECIALLY SOCIO-ECONOMIC ONES.

THE GOALS OF THE ORIGINAL PROTOTYPE PROGRAM SHOULD GUIDE ANY NEW LEASES, BECAUSE NONE OF THE GOALS OF THE PROTOTYPE PROGRAM HAVE YET BEEN ACHIEVED, AND BECAUSE OF THE RECENT COLONY EXPERIENCE, WE RECOMMEND THAT PRODUCTION BE LIMITED TO TEN THOUSAND BARRELS A DAY. THIS WOULD ALLOW A COMPANY TO TEST THE ENVIRONMENTAL, ECONOMIC AND TECHNICAL FEASIBILITY OF ITS TECHNOLOGY, AND IT WOULD AFFORD SOME PROTECTION FOR THE AFFECTED COMMUNITIES AT THE SAME TIME.

IF BLK SHOULD DECIDE IT MUST LEASE, WE PREFER TRACT C-18 OVER C-11. C-18 HAS SOMEWHAT LESS SEVERE

IMPACTS IN SEVERAL CATEGORIES: WILDLIFE, ABILITY TO RECLAIM, LOCAL AIR QUALITY, ET CETERA. WE ALSO AGREE WITH THE STATE LEAGUE OF WOMEN VOTERS THAT PRESUMING A LEASE IS GRANTED, IT SHOULD BE STIPULATED THAT WHERE STATE ENVIRONMENTAL REGULATIONS ARE STRICTER THAN FEDERAL, THEN STATE STANDARDS MUST BE MET. NEW FEDERAL LEGISLATION MAY NOT PROTECT COLORADO RESOURCES. IN ADDITION, THE STATE OF COLORADO SHOULD BE A PARTY TO DECISIONS ON ENVIRONMENTAL STIPULATIONS WHICH ARE LEFT TO THE DISCRETION OF A MINING SUPERVISOR. FINALLY THE LEASE MUST REQUIRE THE RECOVERY OF NAHCOLITE AND DAWSONITE, OR LEASING BECOMES COMPLETELY SENSELESS.

FOR THE MOST PART, WE FOUND THE E.I.S. TO BE

1 CLEARLY WORDED. IT WAS EASY TO FOLLOW FROM ONE SECTION
2 TO ANOTHER, AND PROVIDED ESSENTIAL INFORMATION. ON
3 PAGES 70 AND 171. HOWEVER, WE FELT THAT THE DISCUSSION
4 OF ECONOMIC IMPACTS WAS INADEQUATE, ESPECIALLY FOR
5 ANALYZING COST OF LIVING PROBLEMS ASSOCIATED GENERALLY
6 WITH LOCAL INFLATION, BUT PARTICULARLY WITH HIGH COST
7 OF HOUSING. THERE ARE A COUPLE OF SENTENCES DEALING
8 WITH THESE PROBLEMS. (237)

9 ALSO WE QUESTION THE CONCLUSION THAT
10 DEVELOPMENT OF OIL SHALE WOULD ADD TO GOVERNMENT
11 REVENUES AT ALL LEVELS. THIS IS FOLLOWED UP BY WHAT
12 APPEARED TO BE CONTRADICTORY STATEMENTS SUCH AS SINCE
13 THE METHOD FOR DETERMINING ASSESSED VALUATION OF OIL
14 SHALE HAS NOT BEEN DETERMINED, IT IS IMPOSSIBLE TO
15 PROJECT THE IMPACT OF THE OPERATIONS ON PROPERTY TAXES. (238)

16 ALSO THE SECTION CONCLUDES, FOR LEASING BOTH
17 TRACTS, IT IS UNLIKELY THAT THE INCREASED REVENUES
18 RECEIVED BY COMMUNITIES WOULD OFFSET THE CAPITAL AND
19 OPERATING COSTS THAT WOULD BE NECESSITATED FOR SUCH
20 RAPID POPULATION GROWTH, AND THE HEAVILY IMPACTED TOWNS
21 WOULD NEED LARGE INFUSIONS OF ASSISTANCE.

22 ALSO WE QUESTION THE ADEQUACY OF A
23 DISCUSSION OF COMPETITION FOR LABOR UNDER
24 SOCIO-ECONOMIC IMPACTS. AGAIN MORE MIGHT BE SAID. IT
25 IS NOT JUST OTHER INDUSTRIES OR THE TRADE AND SERVICES

1 SECTOR WHO ARE AFFECTED BY WORKERS LEAVING FOR HIGHER
2 PAYING OIL SHALE JOBS. WE HAVE SEEN FROM EXPERIENCE
3 THAT THE PUBLIC SERVICE SECTOR IS ENORMOUSLY AFFECTED
4 BY A BRAIN DRAIN. TEACHERS, POLICE, CITY AND COUNTY
5 PLANNING STAFF, - ADMINISTRATORS, MEDIA PEOPLE -- ALL ARE
6 AFFECTED. ALL SEGMENTS OF THE WORK FORCE ARE ATTRACTED
7 BY SHALE'S HIGHER WAGES.

8 ANOTHER MINOR OBSERVATION IS THAT WE
9 WONDERED IF IT MIGHT BE APPROPRIATE TO FACTOR IN THE
10 AMOUNT OF RESOURCE THAT WILL BE LEFT UNRECOVERABLE AS
11 PART OF THE NET ENERGY ANALYSIS. AS AN ASIDE, THE LOSS
12 OF PERHAPS MORE THAN 75 PERCENT OF THE RESOURCE ALONE
13 PERHAPS SHOULD INVALIDATE MORE LEASING.

14 WE ALSO WISH THE CULTURAL RESOURCES STUDY
15 AND THE PALEONTOLOGICAL STUDY MENTIONED AS SCHEDULED
16 FOR COMPLETION FOR OCTOBER OF '82 HAD BEEN READY FOR
17 INCLUSION IN THE DRAFT E.I.S.. WE UNDERSTAND THE TIME
18 FRAME UNDER WHICH YOU ARE OPERATING.

19 IN SUMMARY, THE STATE LEAGUE OF WOMEN VOTERS
20 HAS AN EIGHT-YEAR HISTORY OF SUPPORTING THE GOALS OF
21 THE PROTOTYPE PROGRAM. THE GARFIELD-EAGLE COUNTY
22 LEAGUE SEES NO SOUND REASON TO UNDERTAKE ADDED
23 PROTOTYPE LEASING UNTIL THOSE GOALS HAVE BEEN ACHIEVED,
24 ESPECIALLY IN THE CONTEXT OF THE PREDICTED SEVERE AIR
25 QUALITY AND SOCIO-ECONOMIC IMPACTS FOR THE SURROUNDING

1 AREA.

2 THANK YOU FOR THE OPPORTUNITY TO SPEAK.

3 CURT SMITH: KEVIN MARKEY.

4 KEVIN MARKEY: MY NAME IS KEVIN MARKEY.

5 I REPRESENT FRIENDS OF THE EARTH. TO START WITH, I
6 WOULD LIKE TO AGREE WITH BOB THOMASON. MAYBE MORE
7 EXPERIENCE IS NEEDED IN THE MECHANICS OF LEASING.
8 MAYBE WE CAN LEASE C-A AND C-B OVER AGAIN, FIND A
9 COMPANY THAT WILL DEVELOP THEM.

10 IN ANY CASE, MORE SERIOUSLY, FRIENDS OF THE
11 EARTH WOULD HAVE LIKED TO SPEAK IN SUPPORT OF LEASING
12 FOR THE PURPOSE OF TESTING MULTIMINERAL TECHNOLOGIES.
13 HOWEVER, THERE IS NO STIPULATION IN THE LEASE WHICH
14 WOULD ACTUALLY MAKE IT A MULTIMINERAL LEASE.

15 THERE ARE SEVERE OR VERY SEVERE
16 SOCIO-ECONOMIC IMPACTS IN RIFLE AND MEEKER. THERE ARE
17 NO ADEQUATE SOCIO-ECONOMIC MITIGATION MEASURES, LOW
18 RESOURCE RECOVERY AND SEVERAL OTHER PROBLEMS.
19 THEREFORE, UNTIL THESE PROBLEMS ARE RESOLVED, WE
20 ENDORSE THE NO ACTION ALTERNATIVE.

21 THERE IS ONLY ONE ARGUMENT THAT FAVORS
22 LEASING AT THIS TIME, AND THAT WOULD BE THE TESTING OF
23 MULTIMINERAL TECHNOLOGIES. WE SPOKE TO THAT IN DENVER.
24 UNTIL THERE IS A STIPULATION IN A LEASE, THERE IS NO
25 REASON IN FACT TO GO FORWARD WITH THIS PROGRAM. THERE

(27)

1 MIGHT BE ANOTHER REASON, FOR MANY PEOPLE ARE CONCERNED
2 BY THE RECENT DOWNTURN IN THE ECONOMY. ON THE WESTERN
3 SLOPE. EVEN THOSE WHO HOPE THAT THIS NEW LEASE WILL
4 SPUR INDUSTRY AND EMPLOYMENT MAY BE DISAPPOINTED.

5 MULTIMINERAL CORPORATION, THE ONLY FIRM
6 SEEMINGLY INTERESTED AND WITH THE TECHNOLOGY WHICH
7 SHOWS, MIGHT SHOW PROMISE, MAY IN FACT NOT BE THE
8 DEVELOPER IF IT DOES SUCCESSFULLY BID. ITS PARENT
9 COMPANY CHARTER IS IN SEVERE ECONOMIC STRAITS AND MAY
10 NOT BE ABLE TO PROCEED WITH THE DEVELOPMENT OF THE
11 LEASE. MOREOVER, ANY CAPITAL THAT IS DIVERTED FROM THE
12 INDUSTRY FOR LAND ACQUISITION WILL END UP IN FACT
13 HURTING THE DEVELOPMENT OF THE INDUSTRY.

14 SOCIO-ECONOMIC IMPACTS PREDICTED ARE SEVERE.
15 HOWEVER, THE COMMITTED MITIGATION IS INADEQUATE TO MEET
16 THE CHALLENGES POSED BY ONE OR TWO NEW LEASES. AS WE
17 HAVE TALKED ABOUT BEFORE, BECAUSE OF THE POSSIBLE
18 PRE-EMPTION BY FEDERAL LAW OF LOCAL GOVERNMENT
19 AUTHORITIES, THE BLM HAS TO, MUST ENTER INTO THE
20 SOCIO-ECONOMIC IMPACT MITIGATION IN A MORE ACTIVE WAY.
21 THE BONUSES MAY NOT BE ADEQUATE BECAUSE OF LOW CASH
22 RESERVES OF MANY OF THE COMPANIES THAT WOULD BE
23 INVOLVED, BECAUSE OF LOW READINESS OF THE TECHNOLOGY
24 AND THINGS LIKE THAT. BUT MONEY IS NEVER ENOUGH.
25 COOPERATION, PLANNING, INFORMATION AND SPECIFIC

MITIGATION EFFORTS ARE NEEDED ALSO.

THUS WE PROPOSE TWO ADDITIONAL STIPULATIONS:

ONE WOULD BE THE REQUIREMENT OF A MULTIPLE PARTY CONTRACT BETWEEN BLM, THE AFFECTED LOCAL GOVERNMENTS AND THE LESSEES, REQUIRED BY THE LEASE, WHICH WOULD PROVIDE FOR MITIGATION PLAN ACCEPTABLE TO ALL THE PARTIES AND ANY VIOLATION OF THAT MITIGATION PLAN WOULD BE A VIOLATION OF THE LEASE.

SECOND OF ALL WOULD BE REQUIRED A STIPULATION REQUIRING PRE-PAYMENT OF ROYALTIES IF THE SECRETARY DETERMINED IN CONSULTATION WITH THE COMMUNITY AFFECTED THAT BONUSES AND LOCAL GOVERNMENT REVENUES OTHERWISE OBTAINED WOULD NOT BE SUFFICIENT TO MEET FRONT END COSTS.

IN GENERAL, THE COMMITTED MITIGATION PROPOSED IN THE LEASE, WHICH IS BASICALLY THE LEASE ITSELF AND ITS STIPULATIONS, ARE INADEQUATE TO DEAL WITH THE PREDICTED IMPACTS. SOCIO-ECONOMIC IS THE WORST EXAMPLE. AIR QUALITY ALSO. FOR EXAMPLE, THE THE E.I.S. SHOULD IDENTIFY AND ANALYZE ALTERNATIVE CONTROLS AND SITES. THERE SHOULD BE, THERE IS THE ADDITIONAL LEGAL BURDEN PLACED ON BLM AT THIS TIME AS DISCUSSED BY IN THE ENVIRONMENTAL DEFENSE FUNDS IN DENVER, TO LOOK AT ALTERNATIVE CONTROL TECHNOLOGIES AT THIS TIME.

THERE ARE REMARKS ON PAGE TEN OF THE E.I.S. TAKING NOTE

1 THAT BECAUSE OF THE HIGH GROWTH, THE PROBLEMS WITH THE
2 HIGH GROWTH SCENARIOS AND OTHER THINGS, THE DECISION
3 MAKERS SHOULD CONSIDER ONLY THE INCREMENTAL GROWTH, AND
4 TAKE INTO ACCOUNT OTHER ASSUMPTIONS CONCERNING, OR MORE
5 RECENT ASSUMPTIONS CONCERNING THE GROWTH OF THE
6 INDUSTRY.

7 WE FEEL THAT THAT COMMENT SHOULD BE DELETED
8 OR SIGNIFICANTLY REWRITTEN. EVEN WITH THE LOW
9 SCENARIO, WHICH IS TRULY CONSERVATIVE AND ONE
10 ADDITIONAL PROTOTYPE LEASE, THERE WOULD BE A SEVERE
11 IMPACT. THE SITUATION ALSO COULD CHANGE. JUST ONE
12 YEAR AGO WE WERE STILL TALKING ABOUT A VERY LARGE
13 INDUSTRY AND THE EXXON SCENARIO WAS STILL BEING PUSHED
14 AROUND AS A POSSIBILITY.

15 JUST AS THE PETROLEUM ECONOMY HAS RADICALLY
16 CHANGED IN SIX MONTHS, SO CAN IT REVERSE JUST AS
17 QUICKLY. FRIENDS OF THE EARTH HAS TENTATIVELY
18 CONCLUDED IN A STUDY UNDER PREPARATION THAT LOWER
19 INTEREST RATES -- WE ARE HEADED IN THAT DIRECTION --
20 HIGHER OIL PRICES AND SOME POSSIBLE LOAN GUARANTEES ARE
21 ALL THAT IS NECESSARY TO SPUR THE INDUSTRY ONCE AGAIN.
22 IF ANYTHING, YOU SHOULD BE WARNING THE DECISION MAKERS
23 OF THE VOLATILITY OF THE DECISION AND WARN HIM THAT
24 ISSUING A LEASE WILL ADD UNCERTAINTY, RAISE FALSE
25 EXPECTATIONS AND CREATE ADDITIONAL COLONY'S C-A'S AND

1 C-B'S.

2 THERE ARE THREE WAYS TO PARTIALLY MITIGATE
3 THE UNCERTAINTY AND THE IMPACTS CAUSED BY SPECULATION.
4 ONE IS STRICT DILIGENCE REQUIREMENTS, THE LEASE THAT IS
5 BEING PROPOSED IS REALLY NO DIFFERENT FROM THAT OFFERED
6 IN 1974, YET THOSE DILIGENCE REQUIREMENTS HAVE BEEN TOO
7 EASILY AVOIDED. ALSO THE OFFSETS ALLOWED IN THAT LEASE
8 BASICALLY DELAY ANY TRUE DILIGENCE FOR A CONSIDERABLE
9 AMOUNT OF TIME. (106)

10 THERE SHOULD ALSO BE A DEMONSTRATION OF
11 READINESS AND MATURITY EITHER AT THE PRE-LEASING STEP
12 OR AT THE DETAIL DEVELOPMENT PLAN STAGE, AND ALSO AN
13 ADEQUATE BONUS MUST BE A TEST TO THE FINANCIAL
14 READINESS OF THE LESSEE. THAT BONUS SHOULD BE AT LEAST
15 EQUAL IN TERMS OF AMOUNTS RECOVERABLE IN COSTS OR
16 DOLLARS PER RECOVERABLE BARREL TO THE AVERAGE OF THE
17 1974 LEASES, TIMES THE OIL PRICE INDEX AS DETERMINED
18 UNDER THE 1974 LEASE. (106)

19 THE ROYALTIES ARE ALSO TOO LOW, HAS HAS BEEN
20 MENTIONED ELSEWHERE. BLM SHOULD CORRECT ITS ERROR IN
21 THE 1973 E.I.S. AND THE 1974 LEASES, WHICH ISSUED THE
22 LEASES AT TWELVE CENTS PER TON. THAT WAS MADE ON THE
23 BASIS OF A DETERMINATION THAT OIL PRICES WOULD BE ABOUT
24 \$3.00 PER BARREL, INSTEAD OF THE \$7.00 PER BARREL THAT
25 ACTUALLY OCCURRED WHEN THE LEASES WERE ISSUED IN 1974. (119)

IN TERMS OF LAND USE, EITHER C-11 OR C-18
MAY BE THE WRONG LOCATION. MOST TRACTS IN THE M.F.P.
ARE PROBABLY INAPPROPRIATE FOR MULTIMINERAL
DEVELOPMENT, AND ONLY ONE IS APPROPRIATE IN TERMS OF
MINERAL RESOURCE VALUES, ALTHOUGH THERE IS PROBABLY
LESS OIL SHALE NAHCOLITE AND DANSONITE. THIS IS TRACT
C-1.

WILDLIFE IMPACTS MAY BE MORE SEVERE THAN
C-18. HOWEVER, LESS SEVERE THAN C-11, BUT THERE MAY BE
FEWER IMPACTS IN TERMS OF SOCIO-ECONOMIC AND AIR
QUALITY. ANY TRACT IN THE NORTH ALSO MAY BE MORE
ACCESSIBLE AND THEREFORE LESS COSTLY TO DEVELOP, AT
LEAST GEOLOGICALLY MORE ACCESSIBLE.

BLM'S RUSH TO LEASE THIS PROTOTYPE WILL
POSSIBLY CREATE ANOTHER PROTOTYPE FAILURE, AND WE WOULD
ENCOURAGE YOU TO LOOK AT THE POSSIBILITY OF POSTPONING
ANY LEASING UNTIL THE R.M.P. HAS A CHANCE TO LOOK AT
SOME ALTERNATIVE MULTIMINERAL TRACTS.

FINALLY, THE ALTERNATIVE ENERGY IN THE
E.I.S., YOU REFER TO THE ENERGY ALTERNATIVES VOLUME OF
THE FINAL ENVIRONMENTAL IMPACT STATEMENT ISSUED IN 1973
AS BEING ADEQUATE FOR AN ANALYSIS OF ENERGY
ALTERNATIVES IN THIS YEAR. I WOULD POINT OUT THAT IT
IS REALLY NOT ADEQUATE, PROJECTED ENERGY YIELDS ARE
HIGHER, NEEDS ARE MUCH LOWER. IN FACT LOWER BY ABOUT

1 20 QUADS PER YEAR NATIONALLY. SINCE 1973, THE INDUSTRY
2 AND THE GOVERNMENT HAVE IN FACT DISCOVERED OIL PRICE
3 ELASTICITY. ALSO SINCE 1973 THERE HAVE BEEN ADVANCES
4 IN BIOMASS TECHNOLOGY, AND ALSO SINCE 1973 THE ROLL OF
5 ENERGY CONSUMPTION IN DETERMINING THE CROSS NATIONAL
6 PRODUCT HAS ALSO BEEN REPUDIATED.

7 WE WOULD HOPE YOU WOULD RE-EVALUATE THE
8 ENERGY ALTERNATIVES THAT ARE AVAILABLE AND TO CONCLUDE,
9 FINALLY, RECOMMEND NO ACTION OR POSTPONEMENT OF ANY
10 DECISION ON LEASING UNTIL THE SUGGESTIONS THAT WE HAVE
11 MADE HERE HAVE IN FACT BEEN INCORPORATED IN A LEASE OR
12 UNTIL A MULTIMINERAL LEASE HAS BEEN EVALUATED AS PART
13 OF THE R.H.P.

14 CURT SMITH: THANK YOU, KEVIN. TED
15 NATION.

16 TED NATION: MY NAME IS TED NATION. I
17 AM THE CURRENT PRESIDENT OF THE WESTERN COLORADO
18 CONGRESS, AN ORGANIZATION OF CITIZENS GROUPS,
19 CONSUMERS, AGRICULTURISTS AND WESTERN SLOPE CITIZENS.

20 MY TESTIMONY IS PRESENTED ON THE BEHALF OF
21 THE WESTERN COLORADO CONGRESS. THE CONGRESS WISHES TO
22 COMPLIMENT THE TEAM THAT PREPARED THIS DRAFT E.I.S.
23 WHILE WE HAVE A NUMBER OF CRITICISMS WE WILL DETAIL, WE
24 FOUND IT TO BE A GREAT IMPROVEMENT OVER SIMILAR
25 DOCUMENTS WE HAVE REVIEWED IN THE PAST..

1 THE MOST SIGNIFICANT IMPROVEMENT WAS THE
2 ATTEMPT TO CONSIDER THE PROPOSED ACTION WITHIN THE
3 CONTEXT OF THE ACTIVITIES NOW UNDERWAY OR PROPOSED.
4 UNFORTUNATELY, THIS ANALYSIS TENDS TO CONFIRM OUR WORST
5 FEARS ABOUT THE CUMULATIVE IMPACTS OF THE EXISTING
6 PROPOSALS. THE VIOLATION OF PRIMARY HEALTH STANDARDS
7 FOR NITROUS OXIDES, T.S.P. LEVELS, AND SULPHUR DIOXIDES
8 PREDICTED IN THE DOCUMENT ARE FRIGHTENING.
9 SOCIO-ECONOMIC IMPACTS SUGGESTED ARE ONLY SLIGHTLY LESS
10 SO.

11 EVEN THOUGH W.C.C. HAS IN THE PAST PUBLICLY
12 STATED THAT ONE ADDITIONAL PROTOTYPE LEASE SUITABLE TO
13 TEST THE MULTIMINERAL PROCESS MIGHT BE CALLED FOR, WE
14 FEEL COMPELLED BY THE INFORMATION IN THIS DOCUMENT TO
15 RECOMMEND THE NO ACTION ALTERNATIVE OR A POSTPONEMENT
16 UNTIL OTHER ALTERNATIVE ACTIONS SUCH AS A RESEARCH
17 TRACT CAN BE EVALUATED. IF LEASING IS APPROVED, WE
18 CERTAINLY FEEL THAT ONLY ONE LEASE TRACT SHOULD BE
19 LEASED. THIS WOULD CUT THE SUGGESTED IMPACTS BY
20 ONE-HALF.

21 OF THE TWO TRACTS, C-18 IS THE BEST CHOICE.
22 IT WOULD BE EASIER TO RECLAIM, HAS FEWER WILDLIFE
23 IMPACTS, MIGHT HAVE LESS SOCIO-ECONOMIC IMPACT.
24 HOWEVER, THE TERMS OF THE PROPOSED LEASE SHOULD BE
25 CHANGED DRASTICALLY IF THIS IS THE CHOSEN ALTERNATIVE.

(6)

1 SINCE THE JOINT RECOVERY OF DAWSONITE AND NANCOLITE
2 WITH OIL SHALE IS THE ONLY POSSIBLE REASON FOR ANOTHER
3 PROTOTYPE LEASE, THE LEASE SHOULD REQUIRE THE MAXIMUM
4 ECONOMIC RECOVERY OF THESE TWO MINERALS. (27)

5 STRONG SOCIO-ECONOMIC STIPULATIONS SHOULD BE
6 INCLUDED TO ENSURE THAT AFFECTED COMMUNITIES AND
7 INDIVIDUALS RECEIVE ADEQUATE ASSISTANCE IN A TIME FRAME
8 TO BE EFFECTIVE TO MITIGATE THE NEGATIVE CONSEQUENCES
9 OF THE LEASE, BOTH AT THE FRONT END AND LATER DURING
10 THE BUST, SHOULD ACTIVITY BEGIN AND ONCE AGAIN PROVE
11 UNECONOMIC. SPECIFIC PROVISIONS SHOULD BE INCLUDED TO
12 MITIGATE THE IMPACTS ON THE MOST VULNERABLE PORTIONS OF
13 THE POPULATION, SUCH AS THE ELDERLY. HIGHER ROYALTY
14 RATES AND DILIGENCE, AT LEAST EQUAL TO C-A AND C-B,
15 SHOULD ALSO BE REQUIRED IN THE LEASE REQUIREMENTS. (124)

16 THE LEASE STIPULATIONS SHOULD REQUIRE THE
17 LEASE HOLDER TO PAY A COST EQUIVALENT TO AT LEAST THE
18 MARGINAL COST OF NEW ELECTRICITY FOR ANY POWER
19 PURCHASED FROM THE PUBLIC GRIDS. IT SHOULD ALSO
20 REQUIRE THAT ANY COGENERATED POWER FROM LOW B.T.U.
21 GASES BE USED FIRST TO MEET THE TRACT'S POWER
22 CONSUMPTION BEFORE BEING MADE AVAILABLE FOR SALE TO THE
23 UTILITIES UNDER P2R86. THIS WOULD AVOID THE
24 POSSIBILITY OF BUYING POWER AT RELATIVELY LOW
25 INDUSTRIAL RATES AND SELLING COGENERATED POWER BACK AT (240)

49

1 A HIGHER PRICE REQUIRED BY PZP... FOR A DETAILED
2 DISCUSSION OF THIS POSSIBILITY, I REFER YOU TO THE
3 STUDY PUBLISHED THIS PAST YEAR BY THE STATE ENERGY
4 ADVOCACY OFFICE AND TO THE INDEX PUBLISHED WITH IT BY
5 BRUCE COLE.

6 THE WESTERN COLORADO CONGRESS DOES HAVE A
7 NUMBER OF DISAGREEMENTS WITH THE CONTENTS OF THIS
8 DOCUMENT AND SUGGESTIONS FOR IMPROVEMENTS. I WILL
9 TOUCH ON SOME OF THE THEM AND LEAVE THE FLESHING OUT TO
10 OTHERS OR WRITTEN TESTIMONY.

11 YOUR STATEMENT ON PAGE 18 THAT THE 1973
12 PROTOTYPE E.I.S. EXAMINED OTHER ENERGY ALTERNATIVES TO
13 THE PROTOTYPE PROGRAM AND THAT IT IS BELIEVED THAT THIS
14 ANALYSIS IS STILL VALID IS TOTALLY INADEQUATE AND
15 ABSURD. CERTAINLY, CONTRARY TO OIL SHALE, A NUMBER OF
16 RENEWABLE SOURCES OF ENERGY HAVE MADE REMARKABLE
17 TECHNOLOGICAL PROGRESS. THE WESTERN COLORADO CONGRESS
18 RECENTLY SPONSORED A PRESS CONFERENCE WITH AMORY LOVINS
19 AND PRACTITIONERS IN CONSERVATION AND SOLAR IN WESTERN
20 COLORADO TO CALL ATTENTION TO THE IMPACT THIS ACTIVITY
21 IS HAVING LOCALLY AND TO ITS POTENTIAL NATIONAL.

22 THERE HAVE BEEN DOZENS, PROBABLY HUNDREDS OF
23 STUDIES AND REPORTS DONE SINCE 1973 DOCUMENTING THE
24 COST EFFECTIVENESS OF THESE ENERGY ALTERNATIVES,
25 PARTICULARLY IMPROVEMENTS IN EFFICIENCY. INDEED, THE

MARKET, AS IMPERFECT AS IT IS WITH THE
INSTITUTIONAL DIFFICULTIES, IS IMPROVING THIS
ALTERNATIVE.

OIL PRODUCTION HAS SLIGHTLY DECLINED SINCE
1978, BUT IMPORTS HAVE BEEN REDUCED FROM ONE-HALF OF
THE DOMESTIC CONSUMPTION TO LESS THAN ONE-THIRD. JUST
THE IMPROVEMENT IN THE CAR FLEET FROM AN AVERAGE OF 12
MILES PER GALLON TO AN AVERAGE OF 15 MILES PER GALLON
HAS SAVED MORE OIL PER YEAR THAN ANY RESPONSIBLY SIZED
OIL SHALE INDUSTRY COULD EVER PRODUCE. THE POTENTIAL
IN TURNING THE CAR FLEET OVER TO THE 30 TO 40 MILES PER
GALLON COMMON IN SOME NEWER VEHICLES AND IMPORTS, OR TO
THE 70 TO 80 MILES PER GALLON FIGURE BEING REACHED BY
SOME TEST VEHICLES WOULD MORE THAN ELIMINATE OIL
IMPORTS.

INDEED, THE PROGRESS BEING MADE IN AUTOS,
AIRPLANES, INDUSTRY, HOUSING, AND ELSEWHERE, IS ONE OF
THE MAJOR REASONS THAT SYNTHETIC FUELS REMAIN
UNECONOMIC TODAY. AN ADEQUATE E.I.S. REQUIRES A MORE
DETAILED ANALYSIS OF THESE IMPORTANT ENERGY SOURCES.

THE DISMISSAL OF THE TERTIARY EFFECTS
INCLUDING POWER PLANTS IS EQUALLY NEGLIGENT. THIS IS
PARTICULARLY TRUE SINCE THE LOCATION OF PLANTS IN THE
OIL SHALE REGION SUCH AS THE BONANZA PLANTS AND THE
COLORADO-UTE'S PROPOSED SOUTHWEST PROJECT WILL COMPETE

1 WITH OIL SHALE FACILITIES FOR AIR QUALITY INCREMENTS.

2 WE WOULD ALSO QUARREL WITH THE STATEMENT
3 THAT YOU MADE UNDER YOUR NET ENERGY ANALYSIS THAT THE
4 MAJOR ENERGY REQUIRED IS ELECTRICITY, WHICH HAS LESS
5 UTILITY THAN OIL. ELECTRICITY IS THE PREMIUM FORM OF
6 ENERGY AND SHOULD ONLY BE USED FOR PREMIUM USES. IT IS
7 ALSO VERY ENVIRONMENTALLY DESTRUCTIVE TO PRODUCE EITHER 241
8 IN AIR QUALITY IMPACTS WITH COAL-FIRED PLANTS OR THE
9 MANY PROBLEMS ASSOCIATED WITH NUCLEAR FUEL CYCLE. A
10 DETAILED ANALYSIS OF THE IMPACTS OF 21.9 TO 230.8
11 MEGAWATTS IN ADDITIONAL DEMAND PER LEASE UPON
12 RATE-PAYERS AND THE ENVIRONMENT IS CLEARLY CALLED FOR
13 IN THIS STATEMENT.

14 WE ALSO FOUND IT DIFFICULT TO RELATE THE
15 DATA YOU PRESENT ON COMMUNITY REVENUE TO ANY DATA ON
16 COMMUNITY MITIGATION NEEDS. CLEARLY FROM PAST
17 EXPERIENCE WHAT IS NEEDED IS SOMETHING THAT RELATES
18 COMMUNITY INCOME TO COMMUNITY NEEDS IN A REAL TIME
19 FRAME. FUNDS ARE MOST CRUCIAL IN THE FRONT END OF ANY 118
20 PROJECT BEFORE ROYALTIES AND PROPERTY TAXES ARE
21 AVAILABLE. AND AFTER ANY BUSTS WHEN EVEN THE ILLUSION
22 OF FUTURE INCOME IS GONE AND COMMUNITIES ARE LEFT WITH
23 DEBTS, UNEMPLOYED CITIZENS AND OVEREXTENDED BUSINESSES.
24 THE FACT THAT THE LEASE TRACTS ARE IN RIO BLANCO COUNTY
25 AND MANY OF THE MORE SERIOUS IMPACTS ARE IN GARFIELD

1 COUNTY WOULD SEEM TO REQUIRE A DETAILED DISCUSSION OF
2 THE JURISDICTIONAL MISMATCH AND HOPEFULLY SOME LEASE
3 STIPULATIONS REQUIRING ADEQUATE MITIGATION IN GARFIELD
4 COUNTY. STIPULATIONS REQUIRING THE LEASE HOLDER TO
5 ACCEPT THE LAND USE POLICIES AND THE PERMITS AND
6 REGULATIONS OF RIO BLANCO COUNTY REGARDLESS OF THE
7 DEVELOPMENT COUNTY'S DECISION WOULD BE ALSO HIGHLY
8 DESIRABLE.

9 A DISCUSSION OF AGRICULTURE, ONLY IN
10 SHORT-TERM ECONOMIC TERMS WHILE IGNORING THE FACT THAT
11 IT IS A SUSTAINABLE LONG-TERM INDUSTRY WHOSE PRODUCT IS
12 LIKELY TO BE VITALLY IMPORTANT IN A DECADE OR TWO WAS
13 ALSO OBJECTIONABLE. HOUSING, ON THE OTHER HAND, WAS
14 DEALT WITH ON A NUMBER OF UNITS BASIS WITHOUT A
15 DISCUSSION OF COSTS AND HOW VULNERABLE GROUPS WOULD
16 FAIR IN A TIGHT MARKET.

17 THE DISMISSAL OF ACID PRECIPITATION BY
18 REFERRING TO THE FEDERAL FIVE-YEAR STUDY IS ALSO
19 UNACCEPTABLE. I THINK THERE ARE A NUMBER OF OTHER
20 ITEMS HERE THAT ARE SOMEWHAT MINOR THAT WE WILL DETAIL
21 IN OUR WRITTEN STATEMENT, BUT I WOULD LIKE TO CLOSE BY
22 REITERATING THAT WE FAVOR THE NO ACTION ALTERNATIVE.
23 IF THAT'S UNACCEPTABLE, AT LEAST A DELAY IN THE PROGRAM
24 UNTIL THE R.M.P. IS COMPLETE AND UNTIL SOME OTHER
25 POSSIBILITIES LIKE A RESEARCH TRACT CAN BE CONSIDERED.

EXACTLY IS GOING TO HAPPEN.

I PERSONALLY AM CONCERNED BY THIS ADMINISTRATION'S APPARENT GENERAL PHILOSOPHY REGARDING CENTRALIZATION VERSUS DECENTRALIZATION AND CONSERVATION. IT IS NOT AS IF SOLAR WERE A FUTURISTIC THING OR ALCOHOL WERE A FUTURISTIC THING OR THESE RENEWABLE RESOURCES ARE NOT A FACT AND THE TECHNOLOGY IS NOT HERE TO UTILIZE THEM TO THE MAXIMUM.

IT'S KIND OF LIKE POLITICS, WHO IS GOING TO GET WHAT OUT OF WHAT HAPPENS. I AM TROUBLED BY THAT. IT SEEMS TO ME OUR FIRST INTEREST SHOULD BE TO UTILIZE TO THE MAXIMUM SOLAR ENERGY, ALCOHOL. IT WOULD BE A GREAT BOOST TO THE WHOLE ECONOMY AND THE AGRICULTURAL INDUSTRY IN GENERAL.

A LOT OF PEOPLE HAVE EXPRESSED CONCERN ABOUT WHAT IS GOING TO HAPPEN TO THE WATER. THE STREAMS GO INTO THE RIVER. WE ALL KNOW THAT CALIFORNIA TURNED DOWN THE PERIPHERAL CANAL, WHICH I SORT OF ALWAYS SUSPECTED THE REASON FOR THAT WAS, IF SOUTHERN CALIFORNIA COULD USE NORTHERN CALIFORNIA'S WATER, THEN WE COULD USE THE COLORADO RIVER TO DEVELOP OIL SHALE. THAT DIDN'T WORK OUT.

WHERE ARE WE GOING TO GET THIS WATER FROM? WHAT IS REALLY GOING TO BE THE IMPACT ON OUR AGRICULTURE? AGRICULTURE HAS BEEN OUR STAND-BY

1 INDUSTRY. IT'S BEEN HERE EVER SINCE THE VALLEY HAS
2 BEEN HERE. I DON'T THINK WE OUGHT TO JUST GO INTO
3 SOMETHING AS IMPORTANT AS THE DEVELOPMENT OF OIL SHALE
4 PELL-MELL.

5 I WOULD LIKE TO SEE SOME STUDIES DONE ON HOW
6 THE INFLUX OF PEOPLE THAT WOULD COME INTO THIS AREA
7 WOULD AFFECT THE DEVELOPMENT OF AGRICULTURAL LAND INTO
8 RESIDENTIAL LAND. WE ALL KNOW WHAT HAPPENED WITH
9 EXXON. WHAT HAPPENED WITH EXXON? YOU COME IN HERE,
10 CREATE A WHEELER-DEALER TYPE ATMOSPHERE IN WHICH,
11 MILLIONS OF DOLLARS OF THE TAXPAYERS' MONEY ARE SPENT
12 BUILDING SCHOOLS IN THE MIDDLE OF NOWHERE, PRESUMING
13 THERE WILL BE CHILDREN TO FILL THOSE SCHOOLS, AND THIS
14 TIME IT JUST DIDN'T HAPPEN.

15 I THINK THAT IN MY OPINION, WE ARE AT A
16 CROSSROADS OF A HUGE CHOICE, NOT JUST THE WESTERN SLOPE
17 BUT THE ENTIRE COUNTRY, OF HOW WE ARE GOING TO APPROACH
18 THE FUTURE AND THE QUALITY OF LIFE, THE WHOLE THING,
19 ENERGY. AND I DO NOT WANT TO SEE, ESPECIALLY AT A TIME
20 WHEN WE ARE IN THE MIDDLE OF A CRITICAL MONETARY CRISIS
21 THAT NOBODY SEEMS TO BE AWARE OF BECAUSE IT IS NOT
22 BEING TRUMPETED VERY MUCH. I WOULD REALLY HATE TO SEE
23 MR. WATT AND THE BANKING ENERGY CARTEL SHOVE US INTO A
24 DECISION WE MIGHT REALLY BE SORRY FOR LATER.

25 I WOULD LIKE TO SEE -- THERE ARE PEOPLE THAT

1 KNOW ALL ABOUT THIS. IF YOU DON'T KNOW THEM, I WILL BE
2 GLAD TO INTRODUCE YOU TO THEM. THE TECHNICAL KNOWLEDGE
3 FOR THESE THINGS IS HERE NOW. I THINK WE REALLY OUGHT
4 TO INVESTIGATE IT FIRST BEFORE WE JUST GIVE THESE
5 PEOPLE A BLANK CHECK. I AM NOT AGAINST -- IF IT HAS TO
6 HAPPEN EVENTUALLY, IT HAS TO HAPPEN, BUT NOT JUST A
7 BLANK CHECK NOW.

8 CURT SMITH: THANK YOU, JOHN. ARE THERE
9 ANY OTHERS WHO WOULD LIKE TO MAKE A STATEMENT AT THIS
10 TIME? YES?

11 BRAD KLAFEBHN: MY NAME IS BRAD KLAFEBHN.
12 I AM WORKING AS A LIBRARIAN UP IN CRAWFORD, COLORADO.
13 I AM HAPPY TO SERVE ON THE EXECUTIVE COMMITTEE OF THE
14 WESTERN COLORADO CONGRESS.

15 I HAVE JUST GOT A COUPLE OF COMMENTS ON WHAT
16 POLITICIANS LOVE TO CALL THE LIFEBLOOD OF THE WEST,
17 MEANING WATER. ONE STATEMENT IN THE DRAFT E.I.S. SAYS
18 THAT AS A RESULT OF DEVELOPMENT OF THE TRACTS THAT
19 THESE TRIBUTARY LOADS TO THE WHITE RIVER MIGHT BE
20 REDUCED BY THREE THOUSAND TONS PER YEAR. I ASSUME THAT
21 THAT'S BECAUSE NOT AS MUCH SALT LADEN WATER IS GOING
22 INTO THE WHITE RIVER FROM THE PICEANCE BASIN.

23 I WOULD LIKE TO REFER YOU TO A 1979 REPORT
24 DONE BY COLTER AND ASSOCIATES FOR THE U.S. BUREAU OF
25 MINES, WHICH SAID THAT THE IN SITU DEVELOPMENT OF THE

1 TWO PROTOTYPE LEASES NOW IN COLORADO COULD ADD UP TO
2 500 TONS OF SALT PER DAY TO THE COLORADO RIVER FOR OVER
3 A HUNDRED YEARS. THAT STUDY, I THINK, SHOULD GO INTO
4 YOUR ANALYSIS.

5 I ALSO THINK THAT THE IMPACT STATEMENT
6 SHOULD, IF IT CAN, TRY TO EXAMINE THE EFFECTS ON GROUND
7 WATER OF THE SPECIFIC MULTIMINERAL PROCESSES THAT MIGHT
8 BE USED. I AM NOT SURE HOW THAT WOULD MAKE A
9 DIFFERENCE FROM WHAT EXISTING OPERATIONS ARE DOING, BUT
10 IT SEEMS LIKE THAT DATA MUST BE AVAILABLE AND IT WOULD
11 BE GOOD TO INCORPORATE IT.

12 I ALSO NOTICED ON PAGE 135 THAT THERE IS A
13 MAP OF THE AREA WHICH MIGHT BE AFFECTED BY THE LOWERING
14 OF AQUIFERS. IT SEEMS LIKE IT MIGHT TAKE IN A 200 TO
15 300 SQUARE MILE AREA. MY QUESTION ON THAT IS, WHAT
16 KIND OF AN EFFECT THAT WILL HAVE ON RANCHERS IN THE
17 AREA IF THEY NO LONGER HAVE WATER FOR STOCK PONDS.

18 THE STATEMENT THEN KIND OF OPTIMISTICALLY
19 GOES ON TO SAY IT MIGHT BE NECESSARY TO TREAT WATER
20 ONCE MINING OPERATIONS ARE OVER TO HAVE IT BE USABLE
21 FOR STOCK USES. I JUST DON'T SEE ANYONE GOING IN TO
22 PUT A LITTLE TREATMENT PLANT AT EVER INDIVIDUAL STOCK
23 POND. I DON'T KNOW OF ANY OTHER WAY TO GET THAT WATER
24 BACK IN TO WHERE THE RANCHERS NEED IT.

25 I ALSO WAS PLEASED TO READ THAT THE

GOVERNMENT NOW EVIDENTLY HAS MADE A COMMITMENT TO TAKE RESPONSIBILITY FOR THE LONG-TERM CONTROL OF THE LEACH RESULTS FROM THE IN SITU RETORTS. I SHOULD SAY, I WAS ENCOURAGED THAT FIRST TIME THAT I READ THAT, BECAUSE IT'S BEEN THE KIND OF A COMMITMENT THAT NO ONE HAS MADE UP UNTIL NOW. BUT AS I THOUGHT ABOUT IT MORE, IT SEEMED TO ME THAT WHO IS THE U.S. GOVERNMENT REALLY? AND IT'S ALL OF US.

I AM NOT SURE THAT WE ALL SHOULD BE RESPONSIBLE FOR THE POLLUTION CAUSED BY AN OPERATOR WHO WANTS TO GO AFTER EITHER OF THESE TRACTS. IT SEEMS LIKE IT MIGHT BE MORE IF JUST THE OPERATOR WERE MADE RESPONSIBLE FOR THE LONG-TERM IMPACTS OF THAT WATER INSTEAD OF THE TAXPAYER.

THE OTHER COMMENT I WANTED TO MAKE CONCERNS THE APPROVAL OF A WATER AUGMENTATION PLANT. EARLIER IT HAD BEEN MENTIONED ABOUT THE EXAMPLE OF ARCO MINE ON DELTA COUNTY IRRIGATORS. I AM AFRAID THAT WHAT IS GOING ON THERE IS NOT AS OPTIMISTIC AS IT SEEMED. THE COUNTY COMMISSIONERS IN DELTA COUNTY HAD ASKED O.S.M. NOT TO APPROVE A PERMIT FOR ARCO UNTIL A STATE WATER AUGMENTATION PLAN HAD BEEN FILED AND APPROVED. THE OFFICE OF SURFACE MINING DIDN'T DO THAT, AND THOSE WATER USERS NOW ARE IN COURT TO SEE THAT ARCO DOES TAKE CARE OF THE IMPACTS THAT IT MIGHT HAVE ON IRRIGATION

1 WATER. I THINK TO MAKE A PARALLEL WITH THAT CASE TO
2 THE OIL SHALE SCENE, THAT THE STATE COURT APPROVED
3 AUGMENTATION PLAN SHOULD BE PART OF THE APPROVAL OF THE
4 OIL SHALE MINING PLAN, THE DETAILED DEVELOPMENT PLAN.

5 THE IMPACT STATEMENT SEEMS TO SAY THAT PART
6 OF THE CURRENT OIL SHALE LEASE MIGHT TAKE CARE OF THAT,
7 BUT IF YOU READ IT, I DON'T THINK IT DOES. SO THAT'S
8 ALL I HAVE.

9 CURT SMITH: THANK YOU. ARE THERE
10 OTHERS WHO WOULD LIKE TO MAKE STATEMENTS? YES.

11 BILL PRATHER: MY NAME IS BILL PRATHER.
12 I AM SPEAKING FOR MYSELF AS A RANCHER IN THE OIL SHALE
13 AREA FOR A LONG TIME. I BELIEVE WE OUGHT TO POINT OUT
14 SOME OF THE OTHER SIDE OF THIS THING A LITTLE BIT
15 TONIGHT.

16 FIRST, I WOULD LIKE TO REMIND THE PEOPLE
17 THAT THIS COUNTRY, WE HAVE ONE OF THE HIGHEST STANDARDS
18 OF LIVING IN THE WORLD. ONE OF THE REASONS IS, WE HAVE
19 HAD ADEQUATE ENERGY AND WE HAVE USED MORE THAN THE REST
20 OF THE WORLD, BUT I LIKE MY STANDARD OF LIVING, HAVING
21 ELECTRICITY AND ROADS AND I AM NOT TOO SURE I WANT TO
22 GIVE IT UP.

23 AS FAR AS AGRICULTURE BEING ENDANGERED BY
24 THIS, I HAVE WORKED IN AGRICULTURE ALL MY LIFE, AND IF
25 SOMETHING DOESN'T GIVE RIGHT AWAY, AGRICULTURE IS

B. Responses to Comments

The numbered responses below correspond to the bracketed numbers on the comment letters in the preceding section. If a change to the text of the Final EIS has been made in response to a comment, that has been indicated in the response. If not, the response is an attempt to clarify a portion of the text, or explain why a particular issue has or has not been addressed.

1. The purpose of the EIS is to evaluate significant impacts resulting under various proposed alternatives for additional prototype oil shale leasing, and in situations where detailed information is lacking, a worst-case analysis is to be performed. The analysis also considers all secondary and cumulative impacts throughout the area of influence.

PSD permit evaluations are conducted by the responsible regulatory authority under very specific conditions (specified models, emission factors, meteorologic assumptions, limited modeling region) and the permit applies to specific operating conditions. Changes in operating conditions require permit review and possible reanalysis.

These two processes are a result of two separate Congressional mandates which complement, but do not supercede one another. It would be unreasonable to expect modeling results applied for one purpose to be totally applicable for the other. For example, for purposes of the EIS, all emissions from the Craig and Hayden Power Plants are modeled and their impacts for Mount Zirkel Wilderness are determined. NEPA requires that these predicted impacts be compared to Federal, State and local laws or requirements imposed for the

protection of the environment. However, only one unit of the Craig Power Plant is subject to the PSD permitting procedure; PSD compliance determinations apply only to that permitted portion of the facility.

Regulatory agencies cannot issue permits resulting in air quality violations and BLM lessees cannot conduct their activities in violation of any applicable air quality standard or related plan of implementation. Letter 53 lists several mechanisms available to regulatory agencies which allow development when preliminary analyses predict exceedances of air quality standards, and still maintain clean air requirements.

2. The text has been changed for clarification.

3. Additional consultation under the Endangered Species Act has been identified as committed mitigation. This will be performed when the necessary information becomes available on water requirements for lease development. This stipulation is based upon information in the biological assessment dated 16 July 1982 (Letter 1) and is described in the baseline assumptions in Chapter I of this document.

4. The baseline described in the Draft EIS has not been changed. While it is recognized that some of the projects assumed under the No Action Alternative have been temporarily halted or slowed, it is also assumed that they could just as quickly start up again. As the economy improves and markets change, the baseline could easily become fact and could even become an understatement of reality. Given the rapidly changing portrait of energy and mineral development in the region, it is by no means unrealistic to assume the No

Action scenario. The Draft EIS stated the ephemeral nature of the baseline, and that it had been established as a basis for analysis only. Some commenters pointed out that Multi Minerals Corporation has disassociated itself from the proposed sodium mine on Tract C-18. An approved mine plan still exists, however, so the sodium mine remains in the baseline. References to Multi Minerals Corporation have been deleted.

As a tool to better understand the components of the baseline, information has been prepared to assist the reader in understanding the incremental impacts caused by several of the key projects assumed for the No Action Alternative. The Summary of the Final EIS shows critical population impacts by project for Meeker and Rifle. Table IV-2 shows critical air quality impacts by project.

5. This criticism is well taken with respect to empirical methodology in social sciences. However, the function of Table IV-18 was not to indicate levels of impacts specific to this particular analysis, but to provide a theoretical model of the total social change process within which any community might fit its own case of energy boom impacts. The model is intended to be a general summary of what happens to any community undergoing energy project impacts, according to the prevailing literature in the field (as noted in the first footnote in the table).

The actual severity of impacts, and their specific components would reflect, for any community, its initial size, history, location, level of capacity and preparation for growth, social structural state, demography, and community value system.

The evaluation of social impacts on youth in a boomtown situation was based primarily upon evidence indicating that population diversification with its destruction of community traditions tends to produce both psychological discomforts over the loss of cohesion, and opportunities for greater diversity in social contacts and activities. Since the youth are brought into contact with new and different young people (especially in school), it was assumed that they would experience both negative and positive psychological impacts, but that their interaction opportunities would improve because of the diversification. The conclusion that psychological impacts would include the negative was based upon the significant research findings of the commenter in his boomtown youth studies.

Since the theoretical nature of Table IV-18 and Figure IV-12 was apparently not made clear in the text, Chapter IV, Social has been rewritten and rearranged to correct this deficiency.

6. Editorial changes in the text have been made.

7. The likelihood of impacts due to acid deposition was not dismissed by referral to a "Federal five-year study". There are no generally accepted methods for estimating incremental effects of sources on acid deposition and acidification, however. With information provided since the Draft EIS was prepared, additional deposition analysis has been performed and included in the Final EIS with additional interpretation. Due to the state-of-the-art of predicting acid deposition impacts, the current analysis should be considered as a preliminary first approximation, and considerable improvements are anticipated in the future.

8. Chapter I, Issues Raised During Scoping But Not Addressed in This EIS, has been changed to explain why conservation and other energy alternatives have not been analyzed in this EIS. At the time the Prototype Oil Shale Program was established, alternate energy sources were examined as alternatives. Considerable changes have taken place since 1973 that invalidate portions of that analysis, however, it was sufficient at the time to establish the prototype program. One of the goals of that program is to stimulate the development of commercial oil shale technology by private industry. In continuing the prototype program to fulfill this objective, it is felt that examining other fuel source alternatives would be inconsistent and inappropriate.

As stated by several commenters, numerous studies are currently available that compare conservation, oil shale and liquid fuel as energy alternatives. Such an analysis is well beyond the scope of this EIS.

9. Impacts to AQRV's were only considered in PSD Class I areas. The preliminary nature of the proposed action and the state-of-the-art in AQRV impact assessments limited analysis to only visibility and acid deposition although other AQRV's have been identified in the Class I areas. Based on the inconclusive state of research in the area, it was determined that definite effects could not be identified.

Level 1 screening of potential visibility impacts to the Flat Tops from prototype lease tract development was performed. Potential impacts to the other PSD Class I areas are less likely due to their increased distances from

the source. Acid deposition analysis and interpretation has been expanded in the Final EIS.

10. The Draft EIS addresses the energy requirements for oil shale production in Chapter IV, Net Energy Analysis. While oil shale processing is energy consumptive, our analysis shows that, at a minimum, oil shale returns in energy twice what it consumes. It should be noted that oil shale has much more utility than natural gas or electricity and is therefore, a higher quality energy.

11. Although the amount of disturbance and potential for soil loss (erosion) are greatest for the true in-situ technology, this disturbance and soil loss can be reclaimed with technology which has proven to be effective in the Piceance Basin. It is felt that the direct mining with surface retort and mine assisted in-situ technologies are potentially more impacting to the soil because they may require the stabilization and permanent storage of toxic materials in or near the rooting zone of plants using technologies which have not been tested at commercial scale. Chapter II, Development Scenarios states that the majority of disturbance associated with true in-situ development is temporary.

12. The estimated number of deer road kills is based on projected traffic increases (see Chapter IV, Transportation), and data collected by C-b Tract during 1980 and 1981 indicating frequency of deer road kills (see Table IV-16). These figures have been rechecked and are accurate. The reason for the noticeable difference in number of road kills between tracts is due mainly to the approach taken for addressing impacts in this EIS. The existing sodium

lease on Tract C-18 was addressed under the No Action Alternative and not considered a second time in the C-18 Alternative. Because of this, transportation and road kill estimates in the C-18 Alternative were based mainly on requirements for transporting oil shale products. If transportation and road kill estimates for the existing sodium lease and the C-18 Alternative were combined, they would be very similar to those calculated for the C-11 Alternative.

13. The discussion in Chapter III, Hydrology concerning the movement of groundwater up from the lower aquifer through the Mahogany Zone into the upper aquifer is a general description of basin movement. Refer to Weeks, et al. (1974).

14. The emissions inventory was revised to reflect suggested changes, making it more consistent with inventories used on other studies in the region. Considerable variation in emission estimates should be expected due to the general uncertainty of process technologies (i.e., no commercial scale oil shale facility has been constructed and monitored).

Emissions proportionate to Cathedral Bluffs' operation were used for the mine assisted in-situ estimates. Union "B" retort estimates represent the direct mining/surface retort technology. Emission values for these processes were obtained from PSD permit applications. As indicated in the impact analysis technical report (Dietrich, et al. 1982a), nearly 40 percent of the mine assisted in-situ TSP emissions come from the Lurgi process stacks. The MIS gas desulfurization process accounts for 89 and 80 percent of the total SO₂ and NO_x emissions, respectively.

15. Your comment is correct in stating that additional leasing will place additional strain on wildlife. However, the opinion of Bureau of Land Management and Division of Wildlife biologists is that with continued research and studies, plus implementation of successful mitigation, herd objectives and habitat conditions can be maintained. Thus, additional leasing is not necessarily in direct conflict with the Division of Wildlife's goals for wildlife management.

16. The commenters are referred to the objectives stated for the Prototype Oil Shale Leasing Program in Chapter I. The Department of Interior is still attempting to meet these objectives, as stated in Chapter I, Issues Raised During Scoping But Not Addressed in This EIS, (a.). This action is a continuation of the original prototype program. The comments questioning the need for oil shale leasing, the economics of oil shale development, etc., should be directed to the Department's current effort to establish a long-term, commercial oil shale leasing program, and the Programmatic EIS that is addressing the impacts of the new program. The department will not grant a lease unless an equitable return (bonus bids, royalties, etc.) is assured.

17. There are Federal Regulations which require any exploration drill holes to be properly plugged with cement after use. Properly placed plugs will prevent the movement of water between aquifers. Before drilling can take place on Federal land, an Environmental Analysis needs to be done. For additional information contact the Water Resources Division of the U.S. Geological Survey.

18. Section 11 and Section 14 of the Environmental Stipulations are applicable to each other. No section of the lease is intended to stand on its own. In this case, where Section 14 states that spent shale must be stabilized for revegetation, the stipulations for revegetation in Section 11(b) would apply. Similarly, where Section 14 requires selection and preparation of disposal sites for wastes to avoid downward percolation of leached products and other pollutants in aquifers, the provisions of Section 9 - Pollution Water would apply. In both cases, the lessee must demonstrate in the Detailed Development Plan how this will be accomplished and what techniques will be used.

19. The EIS has looked at three potential development technology scenarios: direct mining and surface retorting, mine assisted in-situ processing and true in-situ. These scenarios are not intended to be comprehensive or to reflect all possible methods of oil shale development. They have been selected as representative of a range of potential development scenarios, so that the impact analysis can evaluate a range of potential impacts. An analysis of all possible technologies would be impossible and inappropriate for this EIS. If the decision is made to lease, the successful bidder will be required to specify the development technology to be used. The maturity and potential of the development technology proposed at that time will be evaluated by the Minerals Management Service. The lease requires that measures be taken to assure that all applicable environmental standards be met. Further limiting potential development proposals prior to lease sale would be inappropriate, as stated in the EIS, Chapter I, Issues Raised During Scoping But Not Addressed in This EIS, (c.).

20. Section 11 of the Oil Shale Lease and Sections 1(E)c and 8 of the Environmental Stipulations provide considerable provisions for limiting the impacts of lease development on air quality, but these are not the only requirements lessees must meet. Several Federal and State air quality permits and licenses must also be obtained prior to on-site development. As long as lessees comply with post-operation requirements (especially successful reclamation) no further air quality controls should be necessary.

As an uncommitted mitigation measure, BLM recommended that "additional background monitoring to better assess regional impacts" be performed. Section 10 of the Oil Shale Lease and Section 1(c) of the stipulations already establish a procedure whereby a Mining Supervisor approved monitoring program must be implemented.

21. It was determined that visitor-use impacts to Wilderness Areas and National Park Service lands from population increases resulting from oil shale development would be insignificant, therefore, it will not be elaborated on. The recreation discussion concerned mostly hunting use since this was determined to be the most significant impact.

22. The opportunity for public review is already provided through the Oil Shale Environmental Advisory Panel, an existing public review process. Some decisions made by the Mining Supervisor are necessary for ease of management, and are made without a formal public hearing.

23. The referenced statement in the lease stipulations was not meant to imply a lesser standard and has therefore been deleted from the stipulations both

from Section 8, Pollution-Air, and Section 9, Pollution-Water. Applicable Federal and State air and water standards address this, as stated in the stipulations.

24. The analysis is in fact cumulative and is so stated.

25. The BLM does not subscribe to the theory "if it's already dirty, why worry about making it dirtier", nor does it believe additional prototype lease emissions would not contribute to the deterioration of Western Colorado's air. The EIS examines various alternatives of prototype lease development under the same conditions other existing and planned developments were analyzed. The EIS clearly states prototype lease related emissions "will have an unavoidable, adverse impact on air quality". Since most predicted pollutant concentrations were within half of the most stringent standards (except at 100,000 bbl/day production) these impacts were described as "minimal".

Determining what regional oil shale production values will be ten or twenty years distant is very discretionary. For example, in two recent analyses (Colorado Department of Health 1982b and Pedco Environmental, Inc. 1982) production scenarios varied between 180,000 and 1,163,000 bbl/day. A decision not to lease should be made if there is no likelihood of compliance with all applicable air pollution laws, but in situations where the modeling approach is admittedly conservative with a tendency to over emphasize impacts, the results should not necessarily be construed as a basis not to lease.

26. Mitigation measures included in the Summary are not intended to be specific or complete, but a summary of committed and uncommitted mitigation

measures identified elsewhere in the text. Mitigation measures have been written as detailed and specific as possible given the level of detail of this document.

27. The intent of the Department of Interior has always been to require the development of shale oil, nahcolite, dawsonite and other minerals on these leases. Section 12 of the lease and 30 CFR 231 require that leased minerals not be wasted. However, in order to clarify the Department's intent to see development of associated minerals with the oil shale, the lease has been clarified in two places:

Section 1, Definitions (a) "oil shale" -- the definition includes these other minerals. Nahcolite and dawsonite have been specifically added to the definition. By this definition, then, "Leased Deposits" include these and other associated minerals.

Section 10, Development Plan and Diligence Requirements (a) has also been strengthened to require the lessee to identify when the minerals will be developed in the Detailed Development Plan.

28. The Prototype Oil Shale program is not intended to be a research program. The commenter's opinion that a full range of environmental safeguards and restoration techniques are not being developed at existing prototype leases is inaccurate. The commenter is further encouraged to examine the environmental stipulations of the lease (Appendix A) where mitigation measures and monitoring requirements are specifically delineated.

29. As stated in the Draft EIS, present groundwater use in the Piceance Basin is minimal. Aquifer mixing would only occur provided that none of the mitigation measures are incorporated. In addition, groundwater movement throughout the Piceance Basin is slow, in the order of hundreds of years. Chapter IV, Hydrology, "Leaching of Subsurface Retort Chambers", has been expanded to clarify this.

30. Tables IV-14 and IV-15 were constructed to summarize estimated reductions in mule deer carrying capacity for each alternative and development scenario. Table IV-16 summarizes estimated annual increase in vehicle related road kills. A "total impact table" was not made because combining the estimates from the three tables is not practical since carrying capacity impacts are entirely different from annual road kill mortalities and are not additive. The tables have been summarized to the extent possible to provide estimates to allow comparison of the magnitude of impacts among alternatives, development scenarios, and production levels.

The current state of art in wildlife management has no accurate method of predicting stress-caused mortality. Stress-caused mortality will undoubtedly occur, but to an incalculable amount.

Impacts to mule deer fawning areas would not occur from tract development. Disturbance to big game summer ranges, including fawning and calving areas, could occur from secondary off-tract impacts as discussed in Chapter IV, Wildlife.

The effect of molybdenosis on mule deer is described in Chapter IV, Wildlife, "On-Tract Physical Destruction or Alteration of Habitat". Also under this subheading is information on potential inadequacies of reclamation technology for replacing wildlife habitat and resulting consequences to wildlife populations. The approach taken to estimate impacts from destruction or alteration of habitat was based on the assumption that Oil Shale Lease Environmental Stipulations, Section 4, Habitat Management and Section 11, Rehabilitation would be adhered to (see Appendix A).

31. Indeed, modeled results do not indicate prototype plumes would be transported directly towards Rifle. Detailed plume trajectories displayed in the impact analysis technical report (Dietrich, et al. 1982a) show prototype plumes move south (northwest winds) under influence of the Parachute Creek drainage until they reach the Colorado River, where they turn to the southeast.

Under a west wind condition in the Draft EIS, sources in the Parachute Creek drainage encounter elevated topography west of Highway 13, forcing the trajectories southward. Sources in the Piceance Basin are located further north and do not encounter the same ridge line.

The northwest wind "No Action" analysis did not include either the prototype emissions or the two "new programmatic" leases. The changes in impact region identified was due solely to these "programmatic" leases, which are not included in the Final EIS analysis.

Cumulative impact analysis is one aspect of the environmental assessment of potential prototype leasing alternatives. Cumulative impact estimates intentionally examine overall development on the region, regardless of technologies involved.

32. Several qualifications describing limitations in the modeling approach have been incorporated into the Final EIS (particularly in the "Summary" section). These additional descriptions of the limitations had appeared in the impact analysis technical report (Dietrich, et al. 1982a), and do not represent a change in the quality of analysis performed. Although the models used (and in fact all models) have certain limitations, the results represent a best approximation of potential worst-case impacts under the conditions assumed.

Worst-case analyses, such as the one used, may estimate high pollutant concentrations since worst-case emission, source siting, and meteorologic assumptions are used. These analyses are performed to provide an indication of potential problem areas. Site specific air quality analyses such as those required in the regulatory process would be expected to provide more realistic (accurate) results. Since the approach used for this EIS is absolute worst-case, site specific modeling may yield lower concentration values.

33. To date, no model has been adequately validated (comparing measured ground level concentrations to modeled predictions under a variety of conditions) in complex terrain or on a regional scale. The BLM will be operating twenty-one real time meteorologic stations in the Oil Shale region of Colorado, Utah and Wyoming in 1983 to evaluate the WINDS model's short-term

response in the same manner the Fosberg (1980) and Dietrich studies (1981) evaluated climatic response. The terrain in San Diego County is indeed complex where inland terrain is up to 1800m higher than surrounding coast and deserts. The North Dakota study (Schock 1981) evaluated several models for applicability where source receptor distances are greater than 50km and determined MESOPUFF and RTM were most appropriate. In an independent study, MESOPUFF was again found to be the most scientifically sound model for use in North Dakota's situation (47 FR 42806). CITPUFF, the model used in this EIS, is in the same generic class as MESOPUFF.

34. The high values in the Draft EIS west of Rifle are unrealistic because pollutant puffs stagnate within a flawed wind field. This problem has been corrected by allowing puffs to move outside the convergence area. Therefore, concentration values west of Rifle reported in the Draft EIS were unrealistically high in stagnant areas (especially when 24-hour wind persistence is assumed). However, high pollutant concentrations resulting from plume stagnation do indicate potential air quality problem areas.

35. Negative statements on social impacts are supported by the prevailing literature on the subject. As better and more complete data become available on specific communities and on specific aspects of social change in energy-affected areas, refinements in analysis will become possible, of course. The need for cooperation among government, industry, and the citizenry for social mitigation is addressed in Chapter IV, Mitigation Measures That Could Further Ameliorate The Anticipated Impacts But Are Not Required By BLM (Uncommitted Mitigation).

If mitigation and/or prevention measures are taken, the social and economic disruptions would be greatly reduced or perhaps even eliminated. Such preplanning, expenditures, provision of housing, social services, etc., in advance of arrival of construction workers, have not usually been carried out, however. For purposes of evaluating potential social and economic impacts, these techniques cannot be assumed, since they cannot be mandated.

36. The economic analysis used baseline inventory data collected by the Colorado Department of Natural Resources and the Planning and Assessment System (PAS) economic base model built by Mountain West Research, Inc. The results are similar to, but not identical with, those of the Cumulative Impacts Task Force (CITF) because BLM used different assumptions regarding certain of the oil shale projects -- notably the Federal tracts C-a and C-b. The proposed lease tracts were entered into the model in the same way, and computer runs were made with and without the tracts in all combinations. Differences between the runs comprised the employment impacts, which was expanded into population impacts using standard relationships, with allowance made for single construction workers. Because the community allocations part of the CITF model was not operational, this was done manually and based on data from the other oil shale projects.

37. These summary statements in the text reflect definitions for levels of severity defined at the top of Table IV-20. Since no authority permits BLM to require social mitigation, an analysis must assume a "non-mitigated" case. The residence locations assumed are defined in the population distribution model discussed elsewhere; the Colorado State policy generally discourages development of new towns, and company decisions regarding on-site employee

housing cannot be assumed for analytical purposes. Mitigation by this method would potentially raise other issues for social impact analysis.

38. Employment allocations to communities were developed from data supplied by oil shale projects in the area to the Colorado Department of Natural Resources. Of course, actual results will often differ from any such projections.

39. There seems to be somewhat of a difference of professional opinion. Bloomfield and Stewart (1981) stated in their research "Underground backfilling can reduce the surface environmental impact of retorted shale disposal by reducing the land area required to 15 to 30 percent of that required for total surface disposal. From 70 to 85 percent of the retorted shale can be placed back in the mine." This statement is based on the expansion of an average grade of raw shale of 28 gallons per ton with an in place density of 129 pounds per cubic foot.

40. The text discussion is a "typical" case, referring to an influx of new construction workers. It is intended as a summary of discussion in Chapter IV, Social, which touches on the commenter's points..

41. Community revenue projections include residential and commercial property taxes and sales taxes. They are projected on a per capita basis, therefore they include the effects of both direct and induced population growth.

42. "Projected revenues" refers to the total revenues projected for the communities under the No Action Alternative. The only fiscal impacts

estimated for the other alternatives were those on property and sales taxes. No budget deficit is implied. An addition has been made to the text to clarify this point.

43. The general rise in crime was noted by interviewees (including law enforcement personnel in Silt) in several communities in this energy-affected region during the summer of 1981. From their comments it is assumed that the increase in crime would be faster than the population growth rate, and is explained only in part by improved reporting procedures. The increase is attributed to energy growth (and to some extent also to tourist industry expansion in the Glenwood area).

44. The statement referred to is not statistical, but is clearly attributed in the text to the experience of a specific interviewee whose role in the community lends some validity to it. It should obviously be taken only as "best evidence", subject to refinement with data.

45. The formalization of local governing processes is certainly not a phenomenon confined to small towns whose growth is energy-related. Such bureaucratization occurs as a social structure change in any community (or any organization at all) as it becomes larger and requires more complex coordination of activities and decisions, especially if the membership of the group becomes at the same time more diverse in backgrounds, needs, and interests.

46. That "boom" conditions bring about both social changes and social-psychological stresses for some individuals of a community is well

documented by studies of boom towns reported in the literature on energy development.

47. Interviews with Rangely leaders and citizens done in 1980 by the author of this section (also documented by Margolis for prior years) indicated a strong desire to draw new population and economic development to this isolated town around which gas and oil wells were becoming depleted. The new Western Fuels and Deseret Generating projects have brought facility and service overloads (especially housing shortages) and many new workers to Rangely. Recent comments have suggested that these rapid changes have caused many citizens to feel some concern that the traditional character of the community is being lost.

48. The paragraph in which the seven percent property tax increase limit is mentioned refers to annual operating revenues only. Major new construction is generally not financed from these sources but is financed, instead, by bond issues or other debt instruments. That subject is discussed in the following paragraph of the text.

49. The text discussion here refers to the general descriptive model concerning the entrances and exists of construction workers on energy projects. Different types of projects will vary somewhat from these patterns, and construction can, of course, be slowed or staggered among projects as a mitigation technique. Also, certain continuing construction workers are considered "operations" workers (for instance, the construction workers in underground mines who build the supporting structures as mining progresses). That some construction workers are not transient is discussed in Chapter IV, Social.

50. The conclusions regarding severity of social impacts on various communities for various alternatives are based upon boom town studies indicating that social impacts are directly related to given annual growth rates. Estimates of the "severe" level range upward from growth rates of five percent. We have used estimates on the conservative side, as defined at top of Table IV-20.

The term "quality of life" is a generic term that, like "community well-being", has never been rigorously defined. In energy related social impact analysis the term usually refers (as it does in this document) to those aspects of the human environment which provide citizens a sense of social participation and acceptance, physically healthful and comfortable surroundings, financial security, psychological and emotional comfort, and community pride. That the specific "requirements" of individuals differ is irrelevant to this document, as long as most of the perceived needs are reasonably well met. Better data would obviously make possible a more rigorous definition for "quality of life", and a better analysis of it.

51. Some oldtimers are not only strong proponents of development, they often gain substantial social benefits from community growth -- lower food prices and better shopping facilities, for instance. Nevertheless, the "small town atmosphere and ethos" are permanently lost through boom growth, and most oldtimers express a sense of psychological distress from the loss.

52. The question of "winners and losers" is addressed in Chapter IV, Social, "Quality of Life".

Data on age, income, and other demographic variables on existing population would be interesting for better analysis, but would not answer questions regarding just how many, what proportions, or precisely which persons would "win" or "lose", since we lack reliable information on the characteristics of incoming workers or on the demographic changes in impacted communities, from which predictions could be made.

With respect to social impacts of energy-related growth on the elderly, available "research" data are of two types: "objective indicators" such as income and employment comparisons among age groups (which seem to show the elderly as economic losers); and survey data in which the elderly themselves are asked to describe their feelings and experiences. Most discussions of social impacts on the elderly have painted a bleak picture based upon their supposed economic deterioration, and upon "common sense" speculations about the destruction of social networks.

However, evidence from actual economic analysis indicates that shopping choices and lowered prices are beneficial impacts, and the inflation of property values has positive implications for long-term home owners.

Likewise, surveys of the elderly actually being affected suggest that they may not feel worse than other citizens, and may feel better, for several reasons. For instance a study in Gillette, Wyoming (Pattinson, Weisz, and Hickman 1979) showed that the lowest stress levels were associated with the older ages.

Freudenburg (1982) reviews the major literature, including his own work in Craig, and indicates that three factors may explain why the social well-being of the elderly may not decline (in addition to economic advantages mentioned):

(a) Psychologically, the very fact that older people are more "set in their ways" may make possible the maintenance of an "internalized continuity" in their lives in the face of external change. (They may have learned to weather changes because they have experienced so many changes over their lifetimes.)

(b) Socially, though the streets may be full of strangers and they now feel the need to lock their doors, the social networks of which they are a part may not be touched much so their "social support" systems probably do not break down after all.

(c) Culturally, elderly oldtimers have lived through the lean times when they feared for the future of their home communities, so they have a strong set of positive attitudes about seeing the town prosper, with better opportunities for the young.

These data are by no means conclusive; much more research is needed. But a second set of data (also a surprising reversal of common sense "knowledge") lends further credibility.

Freudenburg (1979a and 1979b) has also found evidence that it may, in fact, be the youth of a boom town who suffer the most negative impacts. The students of a boom town showed significantly greater levels of negativism, distrust,

cynicism, etc., than did a control group of students from three non-boom nearby communities. He tentatively explains this in social-psychological terms: Teenage young people are actively in the process of establishing their individual identities as adults at a time when all the traditional social supports and controls are being disrupted. Since the students (unlike the elderly) are forced into daily direct contact with newcomers at school, they are, he believes, less able to maintain familiar social networks because the networks themselves are in flux.

It is not possible at the present time to evaluate the validity of these findings, but it cannot be said that older citizens are necessarily heavy losers, or that the young have all the best benefits.

Higher property taxes from inflated property values may be a problem for an elderly homeowner; a renter may also be adversely affected financially. An elderly homeowner who sells will generally benefit. Thus there are winners and losers within this age category on these bases.

The notion of "fixed incomes" for the elderly is not totally valid, since social security and many pensions are tied to cost of living increases.

Most studies of pre-impact attitudes in small rural communities have shown an interesting paradox in that citizens asked to describe what they like most and what they like least about their communities generally respond in terms of contradictory characteristics: They will say they like least the poor shopping facilities and like most the small close-knit "know-everybody" context, for instance. Thus it is inevitable that there are gains in one

element at the cost of losses in another. These trade-offs affect everyone probably with a net gain.

53. Even though official figures would be inflated by better reporting procedures and by more and better services delivery, there remain evidence from studies that a higher proportion of persons would be negatively impacted. Text wording has been changed to clarify this point.

54. The beneficial effects mentioned do occur over time, but not in the early years of growth. It is the annual rate of growth, not the overall magnitude, that determines the severity of impacts. Local inflation normally accompanies rapid growth, at least in the early years.

55. Positive short-term economic effects would occur, and they are described in Chapter II, Description of Alternatives in the impact summaries, and in Chapter IV, Economics. The emphasis in the section on short-term use versus long-term productivity is on the duration of those impacts which are adverse.

56. Social impacts are not subject to "reclamation" -- communities cannot revert to the same former social state, though they can lose some gains, return to a smaller population size, etc. Life styles and values would be permanently different from (not necessarily worse than) pre-development times, and thus the original state would be "lost".

57. The comment on prepayment of ad valorem taxes is correct, and the text has been changed accordingly.

Like any special purpose analysis, an EIS has a particular focus. There are issues of economic feasibility pertaining to the raising of severance taxes, but they are outside the scope of an impact analysis. Higher severance tax revenues would increase impact mitigation capability.

58. Most of these points are made in the text. Providing motel type accommodations except for extremely transient workers would not generally be considered a satisfactory mitigation measure.

59. The EPA modeling guidelines (EPA 1978) and proposed revisions do not recommend any specific model in complex terrain nor on a regional scale for regulatory purposes. In general, VALLEY is suggested as a screening technique with COMPLEX I or COMPLEX II as suitable replacements, but these "straight line" models assume persistent wind conditions at the source and hold these conditions constant over the entire plume trajectories over 50km. Exclusive application of these models for this EIS would be inappropriate.

The EPA has tentatively approved use of a model similar to TAPAS for evaluating PSD permits in a specific situation. Also, CEQ regulations (40 CFR 1502.24) on implementing NEPA requirements emphasize "scientific integrity" but do not require utilization of regulatory impact analysis techniques. In fact, as with the situation at hand, regulatory techniques might not meet the "scientific integrity" test. Congressional mandates under NEPA and the Clean Air Act are intended to complement, rather than supercede one another.

60. We agree that from a permitting perspective, only that model used in issuing the PSD permit assumptions should be used to assess PSD compliance. The air quality analysis is not intended as a regulatory analysis and would not satisfy those requirements. NEPA, however, requires that anticipated impacts be compared to Federal, State and local environmental protection laws or requirements (including PSD increments) in order to determine the severity of impact (40 CFR 1508.27).

61. The WINDS/CITPUFF modeling does not violate the principle of mass conservation. The WINDS model is, in fact, based upon the mathematical representation of precisely that principle. Solution of this equation in two dimensions, however, does generate certain unrealistic wind patterns. The model is based upon calculating a divergence and vorticity field which results from the topographic (and thermal) influences on the mean flow. Detailed derivations of the algorithms used are presented in the supplemental impact analysis technical report (Dietrich et al. 1982b). Fundamentally, the model calculates wind corrections to the mean flow by application of the integrated mass conservation equation.

The model assumes that at the top of the mixing layer the vertical velocity is zero, and that at ground level the vertical velocity component is given by a flow parallel with the surface.

This approximation fails in areas where the topography is particularly steep because unrealistically large velocities parallel to the surface are generated, resulting in high divergence (or convergence) fields. Thus while the comment is incorrect that mass is not conserved, it is correct in the

observation that a "circular" pattern of wind is generated which causes the puff to cross and recross the same grid point many times. Physically, such a phenomena is not impossible, but it is entirely unrealistic since, as the commenter observes, vertical winds (other than simply parallel to the topography gradient) would be operative, as well as a host of other physics not included in the model. In summary, we agree that the analysis is overly conservative in such situations.

Based upon this and related comments, the Draft EIS results were examined to identify in which locations WINDS model results were questionable. Two general locations were identified, including northwest of Rifle where a 1,500m elevation change is encountered in one grid cell. This generates a remarkably high vertical velocity of $4 \times 1500/2900 = 2.1$ meters/sec. and divergence of approximately .001 per sec, which is nearly two orders of magnitude above normally encountered divergence fields. Similar elevational gradients are encountered near the Book Cliffs. In these two areas, the modeled wind field is unrealistic.

The effect of such an unrealistic wind field leads to repeated visitation by a puff at the same grid point. In the technical report the effect of such a multiple dose of pollution is indicated to generate concentrations an order of magnitude higher than a typical EPA screening model (e.g., COMPLEX II) would generate. For analysis in the Final EIS, the puff is moved through the area after initial stagnation at an independently determined wind speed. Thus a realistic maximum concentration is provided in the analysis.

62. The purpose of the EIS is to compare the environmental impacts of each alternative, development scenario and production rate for the two tracts. The conclusion that leasing one tract would have more or fewer impacts than leasing another tract for a particular resource value is a legitimate conclusion based on a comparison of specific development scenarios applied equally to both lease tracts. However, an overall comparison of the impacts of leasing one over the other has been deleted from the text.

63. This is the purpose of proposing to lease additional prototype tracts -- to stimulate technology appropriate for this part of the Piceance Basin. Failure to lease under the Prototype Oil Shale Program will not block development in this area, however, since the Department of Interior is in the process of developing a long-term, commercial oil shale leasing program that may also make tracts in the Basin's depocenter available for development.

64. The estimated in-place reserve figures are correct as shown.

65. The minimum royalty described in Section 7(e)(1) of the lease will differ for each of the two tracts, and therefore annual production rates on which royalty is based were not specified in the lease. They will be announced in the notice of lease sale as follows:

Tract	Shale Grade (gal./ton)	6th Year Production Rate (tons/year)	15th Year Production Rate (tons/year)
C-11	30	2,190,000	21,900,000
C-18	30	1,943,000	19,430,000

Annual production rates assumed for the two tracts differ slightly because the stratigraphy of the deposits is different, thereby affecting recoverability.

66. Situations which may warrant application of this stipulation include but are not limited to: (1) excessive snow depths, (2) crusty snow conditions, (3) low temperatures, (4) poor condition of animals, or a combination of these situations. This restriction would not apply to the major areas of intensive use such as the main access road or mine facility site, but to secondary areas where activity is unnecessary or can be scheduled to avoid occurrence during this time period. This allows for continuous tract operation yet also provides areas where deer can reside with minimal disturbance.

67. The statement that "oil and gas exploration and production could continue unimpeded and temporarily prevent extraction of 72 percent of the in-place oil shale per acre" is not in conflict with any other portion of the EIS. This statement is made in Chapter II, No Action Alternative, "Summary of Impacts".

68. Specific stipulations concerning oil shale protection may or may not exist in the existing oil and gas leases depending on when the leases were written. 30 CFR Part 221.18 enables the Minerals Management Service to amend the leases. Considering the above, and the current policy of subordination of oil and gas to oil shale, an Application for Permit to Drill would be denied if oil shale could not be protected.

Discussion of the potential constraints on oil shale recovery due to conflicting oil and gas operations is discussed in Chapter IV, Geology and Mineral Activity. Listing of the current lessee and the duration of each lease is unimportant to this analysis.

69. The recovery percentages presented in the EIS are based on current industry projections and USBM experimental mine recoveries. Percentage recoveries would be much higher if mine pillars were extracted under full subsidence mining. See the "Subsidence" section of Chapter IV, Geology. Current underground mining technology is limited by the requirement to prevent subsidence to protect overlying resources and aquifers. Areas that are mined by underground or mine assisted in-situ methods may be subjected to surface mining in the future with subsequent increases in resource recovery.

70. The statement that "Recovery utilizing true in-situ dissolution mining is presently unknown" only refers to actual recovery. The statement is not intended to say there is no in-situ dissolution recovery method. The method may be applicable and technically feasible within the saline zone as stated in previous sentences of the paragraph in question.

The technical basis for stating that recoveries should probably be highest for direct mining is based on the small stope created at the Bureau of Mines site by Multi Mineral Corporation and industry research in room and pillar mining of oil shale and mining competent microcrystalline saline minerals in the saline zone.

71. No alluvial valley floors have been identified in Ryan Gulch or Horse Draw, no formal determination of their existence and extent have been made, and it is not intended to disallow development in the area described in the EIS as alluvial valleys. It may be necessary to design stipulations which would limit development of alluvial valleys to protect water quantity and quality supplied to agricultural lands off-tract. This would be done at the Detailed Development Plan stage.

72. Possible recovery rates depend on room and pillar configurations, which in turn are dependent on rock compressive strengths, overburden pressures and allowable subsidence. While it is true that little work has been done at depth it is safe to assume that given the conditions found in the center of the Basin, recoveries of oil shale resources and associated minerals will not exceed those projected utilizing the Bureau of Mines pillar configuration. In fact recoveries may be somewhat less due to increased overburden pressures requiring larger pillar configurations.

73. The referenced statement should not be construed to include microfractures.

74. The referenced statement does not contradict existing law, only restates it. There is not reason to remove it.

75. This is accepted practice for all mineral leases issued by the Department of Interior. It does not expand the authority of the Secretary of Interior beyond what is already conferred upon him by law.

76. Requirements for all containments of all slurries are the same.

77. The socioeconomic stipulation has been strengthened, and expanded to include offsite transportation impacts. The revised stipulation requires the lessee to consult with affected state and local government agencies in determining the specific contents of the socioeconomic and transportation report, as well as planning for and mitigating social, economic, and

transportation impacts. See Section 15 of the Environmental Stipulations of the lease.

78. The suggested change has been added to the lease under Section 2(b).

79. The specific reasoning for selecting assumptions appears in the impact analysis technical report (Dietrich et al. 1982a). The technical report also contains comparisons with commonly used EPA models such as COMPLEX II.

The dispersion parameters selected are those generally used by EPA to model in complex terrain.

A more complete meteorologic data base is desired to reduce the uncertainties in the dispersion model analysis. Unfortunately no long-term monitoring of all the required parameters has been conducted in the area of interest.

80. For pollutants to reach PSD Class I areas transport of 50-200km is necessary. Conditions likely to cause the highest level of pollutants at these sensitive receptors would include light, persistent winds under moderately stable to stable conditions with moderate mixing depth.

The modeling approach did not include drainage winds because it is not currently possible to adequately predict these conditions in the area of study, nor is site-specific modeling commensurate with the regional transport analysis approach. Regarding the "accumulation episodes", a regional build-up situation was addressed in the impact analysis technical report (Dietrich et al. 1982a).

Twenty-four hour stability was selected to represent "worst-case" conditions, but the Final EIS also considers a less conservative condition of 10 hour persistence for meteorologic assumptions as measured in the Piceance Basin. These extremes are presented as predicted concentration ranges.

Surface temperature fields were specified as being dependent on terrain height in a climatologically acceptable manner.

"Class E" stability should be sufficient for limiting vertical dispersion under the mixing depth assumed. An excessively high mixing height will allow excessive dispersion but equally critical, too low of a mixing height will isolate elevated plume sources from reaching the ground. Plume rise must also be selected to minimize dispersion prior to transport, but also avoid undue proximate impacts.

Diurnally varying mixing depth box model calculations indicated the modeling approach as applied would provide higher predicted concentrations, and was therefore, "worst-case" (Dietrich et al. 1982a).

81. Due to the preliminary nature of the proposed action, (detailed information is non-existent), NEPA requires that a worst-case analysis be performed (40 CFR 1502.22). This method is admittedly conservative. As more site specific information becomes available, further analyses should be less conservative and projected impacts less severe.

82. Presentation of ranges for likely pollutant concentrations and additional consideration of mathematical accuracy have been incorporated into the EIS. Descriptions of how presentations were derived appear in the supplemental impact analysis technical report (Dietrich et al. 1982b).

83. Although the difference between the predicted short-term NO_x value and the long-term NO_2 standard was recognized in the EIS, only a general comparison was intended. Rudimentary comparisons may be made by factoring in the NO_x to NO_2 conversion efficiency and an estimated ratio of short-term to long-term concentrations; 24 hour NO_x values are expected to be 5 to 35 times higher than the annual NO_2 average concentration. The procedure for determining this empirical relationship is detailed in the supplemental impact analysis technical report (Dietrich et al. 1982b). Based on the predicted ground level 24-hour concentrations for NO_x reported in the Final EIS, violation of the annual NO_2 standard is not likely. It should be remembered that the relative magnitude of short-term NO_x values is more important than its actual value in terms of NO_2 . The EPA is currently considering developing a short-term NO_2 standard (Colorado Department of Health 1982a).

84. The 24 hour persistent wind assumption was selected by analyzing a year of hourly wind patterns generated for the Uinta Basin Synfuels Draft EIS and concluding such persistence is indeed possible. The 10 hour wind persistence is likely based on data collected in the Piceance Basin. Taking this into consideration, the Final EIS contains ranges of concentrations, assuming fixed 10 to 24 hour wind patterns.

85. As described in the air quality impact analysis technical report (Dietrich et al. 1982a), short-term standards are more conservative when compared to typical observed concentrations and therefore are the most easily consumed (the 24 hour increments can be consumed when annual averages range from a likely maximum just equal to, or as low as one-tenth of the 24 hour increment). Because of this sensitivity, a worst-case screening approach was used to evaluate the likelihood of exceeding the most stringent and constraining standards.

With respect to total deposition, the analysis performed represents a more conservative approach while remaining scientifically defensible. Sufficient data are not available to warrant inclusion of specific deposition velocities; worst-case assumptions were adopted instead.

86. Total suspended particulates are comprised of "natural" emissions (wind blown dust, forest fires, etc.) and mechanical/combustion processes (rock crushing, woodstoves, etc.). We agree that fugitive dust (primarily wind blown) comprised of relatively large particles with a greater proportion of mass to size (having greater effect on mass standards), deposit out of the air rapidly, and present little health threat. Fine particulates (primarily combustion emissions) remain in the air longer, can be trapped in the lungs and are therefore a health concern and also degrade atmospheric visibility. Project specific emission values have been separated into ground level and process stack categories in the Final EIS. This breakdown primarily separates fugitive dust from combustion particulates.

87. The analysis does push the state-of-the-art in regional scale, complex terrain modeling. Indeed there is large uncertainty associated with any modeling analysis in complex topography especially one which carries the analysis out to 200km from over 20 sources whose detailed emission characteristics can only be speculated. However, a model was used which accounts for wind variation in complex terrain and is of a similar generic type of a model (MESOPUFF) recommended by EPA (albeit only for that specific situation) for 50km plus distances. Hence, the best available predictive tools were used. Model results should be viewed as uncertain, however every effort was made to bracket the worst possible situation in a conservative analysis. Actual impacts would most likely be smaller than predicted and would be further defined in a regulatory analysis if performed. Ranges are provided to indicate the uncertain nature of the predictions.

88. The aquifer system identified in the Draft EIS is not described as a simple two aquifer system with open vertical communication between aquifers. The system has been summarized into an upper and lower system separated by a relatively impermeable system, and an alluvial system. While more detailed information does exist for the groundwater system surrounding C-b, that is not the case of the potential lease tracts, thus assuming a multilayered system is premature. The data that does exist, show that there is actually not a great difference in salinity between the so called upper and lower aquifers. This indicates mixing of the two systems (Multi Mineral Corporation 1981). Clarifications have been made as appropriate in the text.

89. Using the mitigation measures identified in the Draft EIS the possibility of retorts flooding is reduced. The author was unable to obtain information subsequent to the referenced report however, a report entitled "Assessment and Control of Water Contamination Associated with Shale Oil Extraction and Processing" (Wagner et al. 1981), states that the evaluation of leachate composition from Occidental Oil Shale Inc. retort 3E at Logan Wash, Colorado indicates that several environmentally sensitive trace elements, potassium, lithium, fluoride, vanadium, lead, boron, molybdenum, selenium, and arsenic are not rendered immobile by in-situ processing. The reactions and resulting quality of leachates must be considered with respect to individual chemistry, the alkalinity of natural waters, and the contact times. All of these variables vary through the Basin. Sweeping generalizations will not always be valid.

90. Using a 20 foot per year rate of water transport in the upper aquifer as stated in the Draft EIS, and dividing this into 5,280 feet (one mile) it would take 264 years for transport. This agrees with the commenter's statement "The measurement is far more likely to be on the order of hundreds of years per mile". Please refer to Fox (1980). The text has been changed to show how this number was derived.

91. While the modelers agree that open vertical communication between the main surface stream and the bedrock aquifer is not entirely correct, it is felt that the model is appropriate for the intent of the EIS. There have been numerous studies and field data collection efforts to support the aquifer contributions to stream flow. The potentiometric surfaces of both aquifers slope towards the two drainages in the Basin, seepage runs conducted by the

USGS indicate groundwater contributions to stream flow. Refer to Week et al. (1974), Weeks and Welder (1974), and Robson and Saulnier (1981).

92. There is sufficient data to support the Draft EIS decision and this information has been properly documented in the references. Most of the laboratory leaching studies conducted on spent shales use distilled water. Even the studies which have used groundwater from the Basin do not allow for enough contact time. The contact time between the leached water and the spent shale may be in the order of 1 to 10 years (Fox 1979). In addition there is insufficient data available concerning the groundwater resources of tracts C-11 and C-18. Without detailed water quality and groundwater parameters for the lease tracts the exact interactions between spent shale leachates and the groundwater system is not possible, thus a worst case analysis is required.

93. Underground disposal of surface retorted shale is a viable alternative. Bloomfield and Stewart (1981) in their analysis of various combinations of conveyor, truck, pneumatic and hydraulic transport found the conveyor method most efficient. In addition the approved Sodium Mine Plan found that backfilling of the mine with raw shale can occur after 5 years of surface storage (Multi Mineral Corporation 1981). Since the approved Sodium Mine Plan does not contain the mineral lease rights to oil shale, the additional handling of material makes the economics of backfilling even more critical to create a viable mining operation. Also other sodium mineral interests in the immediate area are planning as a part of their operations to backfill wastes utilizing a slurry method. For more information the reader should obtain a copy of the following reference: Bureau of Mines 1972. An Economic Analysis

of a White Nahcolite Installation in Colorado; Option I. USDI, Bureau of Mines, Morgantown, West Virginia, Open File Report #31-72.

94. The statement is true; only 15 to 18 inches of topsoil may be available where surface disposal would occur. However, to obtain 24 inches of suitable plant growth material (as stated in the text) it was assumed to borrow soil from the deeper soil types including possible use of their subsoils for successful reclamation.

In addition see Chapter IV, Reclamation, "Aboveground Shale Disposal", which discusses alternatives to the use of suitable subsoil excavated at the disposal sites. So in essence this is not "scalping" soil from one area to use in another.

95. Size limitations for restriction of human disturbance on critical deer winter range will be determined on a case-by-case basis. There is no one established limitation distance as it varies with terrain and vegetation. Refer to response 66 for additional information on situations when and how this stipulation would be applied.

96. Deer proof fences would not be considered in violation of this stipulation if fences are constructed with under or over passes to facilitate animal crossing.

97. Nest interference consists of any management action performed to protect and/or maintain raptor nest productivity that interferes with development or recovery operations.

It should be noted that the U.S. Fish and Wildlife Service commented on the exceptions listed for stipulations in the Draft EIS. Apparently these exceptions were proposed, but are currently unapproved. Therefore, these exceptions have been revised to reflect present raptor regulations.

Also, a typographical error was discovered in the legal description for the raptor buffer zone. This has also been corrected.

98. This estimate was derived by summation of the total acreage (20,000 acres) of surface disturbance from all projects addressed in the No Action Alternative. Added to this figure was an estimate of additional acreage (16,000 acres) that would not be physically disturbed, but impacted from human encroachment resulting in a decline in habitat effectiveness. The methodology for calculating reductions in habitat effectiveness is described in the footnote for Table IV-14.

Mule deer population decline or carrying capacity loss was estimated by correlating acreage impacted to population density estimates.

It is a correct statement that not all 36,000 acres would be in a disturbed state at any one time. The data used were based on total surface disturbance acreage and could not be broken down to identify actual acreage disturbed at any one time. Nor was information available to determine reclamation and mitigation effects at lessening this impact.

99. True, these shrub species (mostly salt tolerant) can be established, however not without intensive leaching, irrigation, fertilizing and mulching as was done at the referenced sites. Such intensive management has not been proven or studied for application (economically) on a commercial scale of development. In addition, other researchers still feel that "to date adequate plant establishment has not been achieved on surface-to-shale treatments... Other management options need to be implemented if a successful plant community is to become established directly on Paraho retorted shale" (Redente et al. 1982).

100. Lining of impoundments prior to and after operations is decided on a case-by-case basis and is subject to the 30 CFR 231 regulations. This is addressed in Section 9, (C)(1) and (2) of the Environmental Stipulations of the lease.

101. Mitigation alternatives such as evaluating browse species and methodology for reclamation can not be accurately addressed or evaluated until a mine plan has been submitted describing specific development plans. Such efforts should be appropriately addressed in the Detailed Development Plan.

102. Oil Shale Lease Environmental Stipulation, Section 4, mandates that the lessee submit for approval to the Mining Supervisor of Minerals Management Service, as a part of the Detailed Development Plan, a habitat management plan to include habitat reclamation and mitigation objectives. These objectives would be jointly developed by the lessee, Minerals Management Service, Colorado Division of Wildlife, Fish and Wildlife Service, and the Bureau of Land Management and updated as necessary. The development of an "industrial

association" as described in Chapter IV, Uncommitted Mitigation Measures, would improve coordination of projects.

103. As stated in Chapter IV, Wildlife, "Human Encroachment on Habitat", "the decline in habitat effectiveness depends upon quantity and location of disturbance, topography, and availability of adequate escape cover". An average buffer zone distance of 0.1 mile was derived by analyzing the factors listed above specifically for Tracts C-11 and C-18. Technically, this distance would vary with change in topography and escape cover.

104. True. However, the solitude factor in the immediate tract vicinity and along tract access roads would be degraded due to the addition of mine structures, noise, and number of employees in the area.

105. The proposal to establish an industrial association involving various companies and agencies is only in a speculative stage at the present time. Decisions on how to establish or operate a trust fund have not been determined, but should be decided upon by the association participants. The association participants would also provide input into the selection of mitigation projects. It would be recommended that all companies and agencies involved with habitat disturbance or wildlife management in the Piceance Basin participate and make contributions. Projects would not be limited to the Basin, but also in other areas where benefits can be derived.

106. Several comments were received on the diligence requirements of the lease, some stating they were not strong enough, others saying they were too strict. This is a prototype program that involves the development of new

technology that inherently involves some risks. As such, it is felt that the diligence requirements, including the bonus offsets and royalty credits, are appropriate for this program. Prudent management requires that diligence be shown to prevent speculation, while at the same time allowing for some flexibility. Disallowing bonus offsets or royalty credits would only reduce the amount of the bonus bid accordingly, thereby resulting in a net reduction in up front monies available to the State and local governments for impact mitigation.

107. This action will not have any retroactive effect on any existing prototype leases.

108. While it is believed that complete/perfect communication between the main surface stream and the bedrock aquifer is not entirely correct, it is felt that the model is appropriate for the purpose of the EIS. Presently there is limited data available to describe the groundwater system of Tracts C-11 and C-18. Groundwater quality data collected from wells in the area of the proposed lease tracts indicate that there is not a great difference in the salinity of the two aquifers. The 9,610 mg/l sample taken from the lower aquifer is misleading and a statement to that fact has been incorporated in the Final EIS. To substantiate this fact, a seven day pump test was conducted by Shell on the proposed C-18 tract with the maximum TDS being 1040 mg/l. This indicates that there is a cross-mixing of aquifers in the proposed lease tract areas. Chapter III, Hydrology, describes the aquifer involving three aquifers and a relatively impermeable zone (Mahogany Zone). While this is an oversimplification, information is not available to justify a more complex system.

109. The four percent depletion of flows to the White River is an estimate of the water needed for consumptive use for oil shale development. If the water was obtained by either water table drawdown or tributaries leading to the White River the impact would be the same. The text has been clarified.

110. Mining would not be allowed in the leached zone, due to the poor rock stability (see Chapter IV, Geology, "Extraction of Minerals from the Leached Zone"), so worker safety would be maintained. Resource recovery in the leached zone, although not quantified, would probably be attempted by using a true in-situ methodology.

The nuclear blast may or may not have had an effect that would contribute to the poor mine conditions in the leached zone. Rio Blanco Gas Stimulation Project, Rio Blanco, Colorado, Environmental Impact Statement, Dept. of Energy, 1972, states that previous tests of underground nuclear blasts at Nevada test sites found little or no effect upon rock mechanics for mining areas beyond a 400 foot radius of the blast hole. That EIS further states that since the bottom of the oil shale-bearing strata in the Piceance Basin is 3,000 feet above the blast zone, no explosion-induced fractures would propagate that far.

Measurements have indicated that fracturing may have occurred as far north as Black Sulphur Creek which is 2.5 to 3 miles from the southern boundary of C-11. Any undetected fracturing would be manifested in the form of soluble radionuclides. The hydrology monitoring program conducted by EPA has yet to detect manmade radionuclides from the blast zone. The explosion's effects

upon the continuity of the Mahogany Zone were tested in four wells located approximately 1,300 feet northwest of the blast well. Results of postdetonation pumping tests for aquifer communication across the Mahogany Zone were negative.

Gas produced from the blast well (RB-E-01) and the alternate re-entry well (RB-AR-2) contained contaminations of tritium, argon 37, krypton 85, small amounts of radon 222, cesium 137, and strontium 90. These wells were plugged and abandoned in July of 1977 due to insufficient quantities of gas produced. Contaminated test flow production water from the above wells was disposed into a third well (Fawn Creek Government well #1) and the disposal zone permanently sealed. The Fawn Creek Government well #1 was originally a gas well and was recompleted (after water disposal operations) for gas. The gas contained no detectable amounts of tritium. However, the well does produce a small amount of water that is contaminated with tritium. The well was "shut in" in February, 1977 awaiting determination of final disposition of the gas producing zone.

111. Spent shale disposal piles should be located to avoid dry local recharge areas, however actual pile location criteria would be discussed in more detail in the Detailed Development Plan once the lease is issued. In addition, the type of retorting and treatment the shale will undergo for processing could require alternative types of disposal pile designs and siting criteria. An addition to the text has been made concerning subsidence due to dewatering, mining, and location of shale disposal piles.

112. A section on cooling spent shale has been added to Chapter IV, Surface Reclamation and Solid Waste Disposal.

113. Commercial scale operations will most likely be dealing with a greater volume of spent shale as operations progress. Therefore, stockpiles of raw shale are likely to be less voluminous (unless ground into fine material) and thus have a lesser impact in relation to the spent shale disposal operations. This is the reason for having not added more information concerning leachates from raw shale.

114. Several commenters were concerned about the Mining Supervisor's discretion in approving various portions of the lease requirements. It needs to be stressed that the Mining Supervisor does not make decisions alone. Minerals Management Service has an interdisciplinary team that reviews all decisions and actions taken on behalf of the Mining Supervisor; the State of Colorado participates in the process through the Regional Oil Shale Team, and the Oil Shale Environmental Advisory Panel; and the BLM is involved in all decisions that affect their management authority on the lands involved as required by the Secretary of Interior Order Number 2948, dated October 6, 1972. For ease of communication, the Mining Supervisor has been identified as the single contact for the lessee to initiate all actions on the lease that require approval. Formal public hearings would be called for when a decision by the Mining Supervisor would be far-reaching, controversial, and not in the interest of good management of the lease. However, some discretion must be maintained by the Mining Supervisor in the management of the lease.

115. The mitigation requirements of Executive Order 11988 have been addressed in Chapter IV, Floodplains. Further, site-specific mitigation will be designed in a Detailed Development Plan should tract leasing occur. Oil Shale

Lease Environmental Stipulation Section 11(1) also pertains to protection of floodplains.

The methodology and criteria employed to assess flood hazards can be obtained by contacting the Army Corps of Engineers, Sacramento District, Sacramento, California. The addition of tables describing discharge values would not add to the content and results of this EIS.

116. The pre-project monthly flows of Yellow and Piceance Creeks and the White River are available in the USGS Water Resource Data as described in the text. Post-project monthly flows are available at the BLM White River Resource Area Office from simulation runs using the Bureau of Reclamation Colorado River Simulation Systems model.

117. The statement includes both potential and actual agricultural uses. Because Colorado's water is governed by a pure appropriation system, water cannot be set aside for any one particular purpose as long as it is put to a beneficial use.

118. Impacts on community facilities and services were not estimated in the Draft EIS because sufficient data had not been acquired. That data is now available, and those estimates have been included in the Final EIS. These will be compared to estimates of the communities' ability to issue bonds as a measure of the fiscal problems that would result from this action. See also additions to the section on social and economic mitigation in the Final EIS.

119. Some changes have been made to clarify the language in Section 7, Royalties in the lease. The royalties to be paid for oil shale will in fact increase, since they are tied to the Producer's Price Index. Also note that this increases the minimum royalty rate.

For example, if the royalty were to be applied to production in October 1982, the Producer's Price Index for September 1982 of 718.8 which when divided by the March 1974 index of 201.7, would result in an escalation factor of 3.56 being applied to each of the royalty rate amounts. This would result in a basic royalty rate on the October 1982 production of 42.8 cents per ton of oil shale for oil shale processed either through mining or in-situ methods with a reduction or addition of 3.6 cents per ton for each gallon of shale oil per ton above or below the 30 gallon average, and a minimum royalty rate of 14.3 cents per ton.

Tying the royalty rate to cents per ton rather than as a percentage of the value of the oil produced is simple to compute and, since it is adjusted by an escalation factor based on the Producer's Price Index for crude petroleum, it fairly reflects the relative value of the end product.

120. Monitoring is an ongoing process that continues prior to, during and after development. Existing data may also be used to supplement baseline monitoring. Current provisions in the lease for baseline monitoring are felt to be reasonable.

121. The length of time of environmental monitoring following abandonment will be determined when abandonment is contemplated. Abandonment plan

approval would be contingent upon establishment of a reasonable timetable for continued environmental monitoring. The length of time is determined by the estimated period it will take to reclaim the resources affected, based upon the knowledge of the reclaimability of those resources at that time. The lessee is responsible for environmental problems related to reclamation from the time of cessation of mining until the reclamation bond is returned to the lessee, as described in Section 9, Bond in the lease. Clarification has been added to the text.

122. The language "consistent with or equal to" is intentionally used to allow for rehabilitation to different land use than pre-leasing. The language of this section has been changed to "consistent with or equal to" in both places where it occurs.

123. This is beyond the scope of this EIS.

124. In order to avoid intervening in local government activities any more than is necessary, BLM's policy is not to include stipulations in its leases imposing financial contributions or other types of social and economic mitigation requirements on the lessee. County permitting authority has been used successfully for that purpose in Colorado.

It should also be noted that 50 percent of lease royalties, bonus bids and other mineral-related federal revenues are returned to the state for the purpose of social and economic impact mitigation, and the state passes a portion of these revenues on to impacted counties and communities.

An addition has been made to the text in the Uncommitted Mitigation Section to clarify these points.

125. Several alternative tracts were offered for expressions of interest by industry. The tracts offered were distributed throughout the Saline Zone and were amenable to development of oil shale concurrently with associated minerals. However, industry only expressed interest in C-11 and C-18, thereby limiting the analysis of the EIS. Little purpose would be served in analyzing tracts in which no interest had been shown for development. These tracts meet the Department of Interior's intent to offer lease tracts with potential for development of oil shale concurrently with associated minerals and the objectives of the prototype program.

126. The Management Framework Plan was not intended to be a detailed environmental impact assessment, but a decision document on managing the public lands in the White River Resource Area. This EIS provides the environmental analysis the commenter feels is lacking in the MFP.

127. It is true that a large migrating open pit could theoretically recover a much larger portion of the oil shale resources than simple room and pillar mining, but it is not within the scope of this EIS to discuss or attempt to determine what, if any, methods may be utilized in the "distant future" to recover apparently lost resources.

Open pit mining was not fully analyzed as a Development Scenario because it is unlikely to occur on either tract as discussed in Chapter IV, Geology and Mineral Activity, "Surface Mine Impacts".

128. The objectives of the Prototype Oil Shale Leasing Program are the tract selection criteria. A more formalized tract selection process will be developed for the Department's long-term, commercial oil shale program.

129. BMML's Socioeconomic Assessment and the Garfield County Human Service Plan provide thorough coverage of that part of the impacted area, although some questions can be raised about the methods used in the latter study. However, data from these studies, particularly on community facilities and services, have been incorporated into the Final EIS.

130. The trend in social impact analysis in recent years has been to include more and more detailed current socioeconomic indicator data (such as on facilities and services) as if this procedure constitutes social impact analysis. (It does not. Social impacts include such components as are outlined and discussed in Table IV-18.) Of course, in many cases socioeconomic data are important to the purposes for which an analysis is made. Most especially such information is used by a community for planning financial mitigations for negative impacts. Some discussion of the individual community facilities expected to be most severely affected by this EIS program has been properly included in Chapter IV, Economics.

However, almost all communities (and counties) at all times have money problems. Sufficient funding never exists for building extra capacities into all facilities (streets, sewers, water) and services (police and fire, mental health, education) for far into the future. Thus, almost every town may have "excess capacity" in one or two areas of need and little or none in the rest. Boom growth will find one community with a recently built new school having

extra classrooms, but with need for a new sewer system; another community will have a new sewer system with excess capacity, but an inadequate hospital; and so on. Boom growth will generally fill up all the "excess space" wherever it may be, and overload those components already full. The overall financial picture will be similar, though details may differ among communities. For decision documents such as this EIS, such data are of limited value; for social analysis, they serve virtually no purpose except as their social implications can be traced; and these depend primarily upon the numbers of new people coming in, the rates at which they enter and leave, and their characteristics relative to the host population. These latter factors are more important for social analysis than are the socioeconomic indicators, for several reasons.

First, the lag time between preparation of an EIS and the time social impacts other than financial preparation are scheduled to occur is sufficiently long that even finely tuned present data will have become largely obsolete.

Second, even though some community social structures may be more capable than others of absorbing numbers of people, nevertheless, as noted above, levels of "overload" tend to be fairly consistent in all services and facilities for a community. It is unlikely, for instance, that drastic social impacts would occur upon the school system while the mental health and police departments were experiencing only insignificant impacts.

Third, severity of impacts is directly correlated with annual growth rates upon initial size of community. In fact, studies of energy boom towns have demonstrated that this is the single best predictor we currently have of social impacts.

For improving social impact predictions we need better information on such things as characteristics of the incoming work force compared with the locals, schedules of in-and-out transiency for construction workers, and the degree of local "readiness" to "accept" the new people (dependent upon social-historical rather than purely historical information).

While financial problems are often predictable with some accuracy, no standardized definitions exist for what constitutes "severe" social impacts, nor do researchers agree upon the rate of annual population increase associated with the term "severe". Judgements range from five to fifteen percent annual growth at the "severe" level. In any case it will vary according to the factors just mentioned.

Unfortunately, except for a limited study of construction workers several years ago (Mountain West 1975), no reliable data on pertinent work force characteristics are available---these have proven very difficult to obtain, though a clearer picture is beginning to emerge. Especially for construction workers, these data would be important. Objective measures of community "readiness" are lacking, and readiness constantly changes for individual communities. We can say that in recent times communities in the path of energy development have been able to benefit from experiences of prior boom towns and are not generally better prepared; also energy companies are picking up some responsibility for ameliorative measures. The Garfield County 1982 Human Service Plan is a notable example of advance area planning.

Thus the severity of negative social impacts is reducible to the extent that planning can be done around advance knowledge of rates of influx, in-and-out turnover (construction) or permanence (operations) of workers, the needs and interest they will bring, the degree to which these will be compatible with and acceptable to present citizens, and the extent to which time and funds are available for advance financial preparations, for needs defined by a given community.

There are, of course, social implications in such things as housing shortages, school overcrowding, and insufficient alcohol treatment and mental health services, and these could be considered. Such impacts would be generally similar, for a given shortage, across communities.

Percentages shown at top of Table IV-20 reflect our own best judgments regarding relative overall severity of social impacts among the various communities, taking into account their levels of readiness and preparation as we can evaluate these. (Chapter III discusses readiness of the communities involved.) Comparisons among communities remain the same relative to each other.

We should emphasize once more that since the EIS precedes the lease decision and is part of that process, its primary purpose is to estimate levels and directions of social impacts, not to evaluate the details and problem areas for specific communities which those communities would need for planning and preparation.

To summarize, it benefits communities to know themselves and to decide just what social structural elements will be changed, what facilities will need modification, what social services will need to be expanded or added, and what ways are available to pay for these things. The Federal government helps with these through available funds, etc. (see Chapter IV Social and Economic mitigation section for discussion of these.) But it is not the Federal government's function to provide needs assessment data, only to provide the best possible predictions of growth so that communities may assess their own needs.

We recognize the deficiencies in this EIS that are due to lack of adequate research data on the key variables of incoming worker characteristics, social readiness of local citizens, etc. These deficiencies must wait for solution on better social data, and these data are slowly accumulating.

131. Estimates of manpower needs for the alternatives are based on data collected by the Colorado Department of Natural Resources on other oil shale projects in that area. Given that the tract developments are hypothetical, and that construction schedules of these and other projects are uncertain enough that the future labor supply at any point in time is essentially unpredictable, manpower needs must be estimated generically based on data and projections for similar projects. Therefore, these uncertainties would cause a detailed skill analysis of the labor force to give a wholly false impression of accuracy.

132. Requiring specific methodologies for Socioeconomic impact assessment is inappropriate for the lease stipulations. The EIS used the most recent publicly available data from the Cumulative Impact Task Force (CITF) - see response 36.

133. It is felt that the 50 percent of the bonus payments being returned to the State of Colorado essentially constitutes a form of prepayment for front end socioeconomic mitigation costs since payment begins prior to actual development activity on the lease tracts. If the State makes these monies available to local governments for this purpose, requiring advance royalty payments would be unnecessary.

134. A section on gassy mine conditions has been added to Chapter IV, Geology and Mineral Activity.

135. The model used for the determination of groundwater impacts resulting from dewatering operations is sufficient for the purposes of this EIS. The potential lease tracts C-11 and C-18 do not have the wealth of hydrologic data that existing leases C-a and C-b have. Because of this, a site-specific model would have to utilize average Basin wide input parameters for modeling purposes. In addition, site-specific models must assume some kind of boundary condition. Hydrologic impacts do not end at this boundary.

A regionalized model examines Basin wide impacts, which is of importance to any Environmental Analysis. Existing modeling inputs and assumptions can be found in Taylor, (1982). Model limitations are identified in the text.

136. It would be difficult and inaccurate to attempt estimating what the actual reductions in carrying capacity would be with existing information from these impacts. Toxic uptake by vegetation, effects on springs, and revegetation of browse and cover on spent shale piles have been discussed to

the extent possible in this EIS. These impacts, however, must be further addressed with adequate mitigation developed in the Habitat Management Plan required by Oil Shale Environmental Lease Stipulation 4(b).

Discussion with Minerals Management Service indicates that Oil Shale Environmental Lease Stipulation Sections 4(B) and 9 do provide an adequate basis for mitigating aquatic and other habitats.

137. Changes have been made in the text to help clarify this concern. We are not able to accurately assess what will take place in several hundred years should spent shale be exposed at the surface. This is because the composition of the waste material is uncertain and the effects of weathering of this material are unknown. It is possible that spent shale could become soil parent material. A soil derived naturally from such a material could have zones of salt and clay accumulation and could be high in clay overall. Such a soil would be similar to Natragrids which occur in various locations in the Piceance Basin. These present day soils support stands of greasewood, shadscale, fourwing saltbush, western wheatgrass and other fairly salt tolerant plants. It must be kept in mind that this discussion is speculative. Making predictions of what will happen several hundred years from now is an uncertainty.

138. A detailed analysis of the alternative control technologies available for air and water pollution is not within the scope of this document. The lease requires compliance with all existing state and Federal standards. At the time of submission of a Detailed Development Plan, the lessee would have to demonstrate compliance with these standards to the satisfaction of the

Mining Supervisor. The Environmental Stipulations of the lease (Section 1(B)) further provide that the lessor may amend stipulations to make them "consistent with any new federal or state statutes for the protection of the environment upon their enactment and with regulations issued under those statutes." In addition, the stipulations provide for an annual review of technology advances and the need for amending existing stipulations to make activities "as free from environmental damage as is practicable. Toward this end, systems which require pollution control devices shall possess sufficient flexibility to adopt improved technology at practicable intervals and shall be constructed with the understanding that continued compliance with changing pollution control laws is required."

The purpose of these and other provisions of the lease are clearly to require the lessee to provide for the protection of the environment through advanced pollution control technology. To examine all technological options currently available; without knowing the development process to be used, would be excessively burdensome, would serve no useful purpose at this time, and is outside the scope of the EIS. It is felt that the decision to lease can be made with the information provided in this document.

139. These elements were not considered in the current EIS due to a lack of necessary data concerning specific siting, on-site meteorologic data, proposed processes and control technologies. Worst-case analysis and qualitative comparison of lease tract options were utilized instead.

140. Level 1 visibility analysis provides an adequate indication of possible "worst-case" visibility impairment. Emission characteristics (i.e., source parameters) are not specified in sufficient detail to warrant higher level

analysis. Detailed, less conservative analysis, would be addressed in a site specific EIS and for permitting purposes. The current state of knowledge and available data are not sufficient to project regional haze estimates.

141. We are unaware of any technique which could be used for projecting ozone impacts other than the method used in the referenced analysis. This is supported by the fact that the contractor who performed that analysis, is the developer of virtually all of the ozone analyses currently in use. Thus, their choice to use EKMA, admittedly developed and validated for urban areas, is made on the basis of extensive experience and scientific expertise. In examining the results of their analysis no substantively different results would be obtained if additional computations would be performed. Referral to their analysis provides the necessary scientific integrity.

Information currently available does not suggest any significant impacts associated with carbon monoxide or hazardous pollutants (such as heavy metals or radioactive compounds) from oil shale development. Due to the limited development of oil shale technologies, little data are available regarding release of hazardous pollutants. Studies are continuing which will supplement the preliminary analyses. Further discussion of these pollutants is included in the supplemental impact analysis technical report (Dietrich et al. 1982b).

142. The "exceedances" are first maximum hourly averages and do not represent ozone standard violations. The following discussion appeared in Volume 2 of the 1981 C-b Annual Report (Cathedral Bluffs Shale Oil Company 1982):

"Ozone is the only (gaseous pollutant) monitored consistently having a measurable mean concentration. Also, in the past it has closely approached the ambient air standard, this behavior is of interest because there are no development-related emissions of the type and magnitude to cause elevated ozone levels..."

"Since ozone is the product of (photochemical) reactions and also present in the stratosphere rather than an emitted substance, its concentration is subject to variations due to stratospheric down mixing or to changes in the intensity of isolation, providing the driving force of ozone-producing reactions. This results in a seasonal pattern ... with the highest mean concentrations in summer, ... and lowest in winter. Over the history of ozone monitoring on-tract this seasonal pattern coupled with the large random component has been consistently present."

The EIS did not intend to "dismiss" this situation, but to indicate the lack of knowledge regarding elevated ozone concentrations.

143. Worst-case situations are well known and easily established with regard to simple, straight-line Gaussian models from individual sources. When multiple sources are considered, worst-case situation become less obvious. Adding a complex topographic environment makes identification of the absolute case extremely difficult. The modeling approach applied considered the following when determining the worst-case scenario:

1. Spatial meteorologic patterns.

2. Temporal meteorologic patterns.
3. Relationship of the source distribution of meteorologic patterns.
4. The likelihood of the meteorologic patterns.

Plume trajectories for both potential prototype lease tracts were modeled through all eight cardinal wind directions (plus west-southwest because of its historic wind dominance). The west-southwest wind scenario predicted the highest impacts to PSD Class I area (Flat Tops Wilderness) due to the combined emissions, and was considered to be the "worst-case" situation. Prototype impacts to Dinosaur National Monument and Mount Zirkel Wilderness were also modeled. The screening analysis indicated a low probability of direct impacts to the TSP non-attainment area, Colorado National Monument and towards Arches National Park. Due to its higher elevation and geological sensitivity, the Flat Tops Wilderness is believed to be more sensitive to acid deposition than the surrounding areas.

144. Although not a frequent occurrence, Systems Applications, Inc. (1982) analysis of actual meteorologic data suggest 24 hour wind persistence is not an unrealistic assumption, and indeed worst-case. Temporal wind patterns are not directly accounted for, but local flows probably do not exert a profound influence on a regional scale under worst-case conditions. If a stable period were to persist for a few days, local scale accumulation would override regional impacts. Worst-case trajectories are, by definition, relative to the receptor, and in this analysis several wind fields were compared to determine which was most likely to impact a PSD Class I area. Twenty-four hour persistence of areas of convergence are unlikely - the modeling approach has been refined accordingly.

145. The modeling performed allowed consideration of TSP, SO₂ and NO_x impacts in a specific manner. Sufficient scientific data are not available to warrant inclusion of details such as separate reaction rates for SO₂ or NO_x, nor deposition velocities for SO₂ or NO_x. Worst-case assumptions were adopted in order to make conservative estimates, as required in NEPA (40 CFR 1502.22).

The rate at which several projects proceed will vary and cause a commensurate variation in air quality impacts. The modeling approach assumed the projects would have developed up to the designated production level by 1993 and 2003. It is not reasonable to expect predictions of yearly or bi-yearly emission variations over twenty years for technologies which are speculative.

146. The emissions inventory has been revised and is listed in the Final EIS along with plant location, elevation, production level and operating process. The primary source of Colorado oil shale emissions is the Colorado Department of Health - Air Pollution Control Division (Lauderdale 1982). The stack parameter data used to separate ground sources from elevated stack sources came from Pedco Environmental, Inc., (1982) as did emission values for the Rio Blanco and Superior-Pacific Processes. Chevron mining/retort operations and upgrading facility emissions, and general plume rise values came from the respective PSD permit applications (Verstuyft 1982). All Utah source emissions data came from the Draft Uinta Basin Synfuels Development Air Quality Technical Report (Systems Applications, Inc. 1982). Colorado power plant emissions were calculated from applicable source performance standards (Frey 1982) and reported coal usage/heat content (Ladwig 1982).

147. The recommended procedure referred to: (a) is solely to "resolve the local winds"; (b) was provided prior to extensive experience with WINDS model applications; and (c) additionally states that "non-model dependent factors (terrain complexity and computer resources) must be considered in selecting the grid interval" (Fosberg et al. 1976). Sensitivity studies were conducted (as the commenter suggests) which indicated little sensitivity of plume paths to smaller grid spacing. Large spacing leads to a less refined wind pattern and hence straighter plumes. The end point of no wind variation would simulate conventional Gaussian model assumptions. "Realistic plume trajectories" is a matter of judgment. The grid spacing was selected based on examination of the topography in the vicinity of the sources, for example, insuring that the elevation of sources were correct, that major topographic features were resolved, as well as a study of the wind fields simulated. The grid spacing selected is proper in resolving major topographic influences on the winds. (Wind flow diagrams are available in the supplemental impact analysis technical report; Dietrich et al. 1982b).

148. The sequence and method of extraction of oil shale, nahcolite and dawsonite for each Development Scenario that was assumed for purposes of the analysis is described in Chapter II- Description of the Alternatives.

149. This contradicts information originally provided by the Minerals Management Service, therefore, no change to the text has been made.

150. Figure III-11 is used only to give the reader the general relationship of the two water bearing structures of the Basin. The addition of Yellow Creek to the figure would provide no more additional information to the analysis.

151. For purposes of this analysis, the development technology assumed for both C-a and C-b is a modified in-situ process.

152. These figures for C-a and C-b were provided by the Programmatic EIS team. They are in agreement with the range of water requirements provided by the Minerals Management Service who have been monitoring those tracts. The predicted water requirements for C-11 and C-18 are within this range. As stated in the text, these figures can vary widely, depending on the process used.

153. The White River station near Ouray, Utah was selected for the following reasons:

1. This station is the closest point in the Bureau of Reclamation Colorado Simulation System Model to the Basin, because the White River Dam replaced the Utah-Colorado station.
2. There is minimal inflow between the White River near the Utah-Colorado Stateline Station and the White River near Ouray Station.

For further information, see the reference sites in the Draft EIS for Bureau of Reclamation simulation model.

154. Discussion of in-situ spent shale is not included due to the lack of public data. Although research and information has been gathered, discussion with researchers whose work deals with spent shale disposal sites (DOE,

Laramie Energy Technology Center, U.S. Army Engineer Waterways Experiment Station (Geotechnical Lab), and Dappolonia Consulting Engineers Inc.) indicate that this information is proprietary and available only to the companies who have directly conducted research in this area.

155. The commenter has misinterpreted the referenced statement, and is encouraged to reread it. The text is self-explanatory.

156. The referenced statement in the text has been verified, and is correct as shown. No change to the text has been made.

157. Concerning compaction on a large scale, although it has been performed using conventional equipment it has not been conducted on a large scale commercial operation. No change to the text has been made.

158. This EIS is adequate for the level of detail it presents and the references used. Specific impacts caused by disposal, volatilization from pile surface, microbial transformation of metals to toxic compounds and construction impacts will be identified and analyzed in more detail when the Detailed Development Plan is submitted by a lessee.

159. Discussion with the principal authority of the two publications you cited indicates that this section is adequate as written.

160. The model assumptions are outlined in Taylor (1982). The low hydraulic conductivity will lead to rapid recovery, not slow as stated in the comment. The text has been changed for clarification.

161. The No Action Alternative states that C-a and C-b will be developed. C-a was assumed to be developed at two scenario's 50,000 bbls/day and 100,000 bbls/day, C-b scenario's were 21,000 bbls/day and 76,000 bbls/day. For any development to take place both tracts will have to be dewatered. Robson and Saulnier (1981) simulate dewatering of both these tracts and the water quality impacts associated with them. The impacts to the White River were determined using the Bureau of Reclamation's Colorado River Simulation System model. While the same model was not used for development and No Action Alternatives, both models are regional models and a comparison is valid.

162. The sentence immediately following the referenced statement clarifies this comment.

163. Most research has shown that gentle slopes and northern exposures are always easier to reclaim than the more xeric south facing slopes in arid climates.

164. The Minerals Management Service, Oil Shale Office in Grand Junction was consulted for clarification on this comment. It was determined that no change to the text of the Final EIS is necessary.

165. Piceance Creek as measured at the White River according to the USGS Water Resources Division has never experienced periods of no flow. The least amount on record was .5 cubic feet per second measured on July 21 and 22, 1966.

166. Pipeline transportation alternatives have not been addressed, since such speculation is felt to be beyond the scope of this EIS. This has been stated at several places in the document. The desirability of alternate product transportation modes has been identified.

167. Further clarification is unnecessary as it would not substantively change the analysis.

168. No ranking was intended or suggested.

169. The general location of the Bureau of Mines Horse Draw facility is correct as shown.

170. Chapter IV, Geology and Mineral Activity describes in detail the impacts of oil and gas activities on oil shale for the "No Action Alternative". The portion which you referenced as needing more clarification is the "Description of the No Action Alternative". The wording of "temporarily prevent extraction of ... oil shale ..." implies that the oil shale could still be recovered eventually regardless of whether the oil and gas was subordinated to oil shale.

171. The comment "soil losses depend upon the degree of reclamation success" is an accurate statement. Also, 100 percent mitigation of AUMs is not a certainty, but appears to be a realistic projection for the No Action Alternative. These two statements appear contradictory unless the time period factor required for vegetation replacement is applied. Specifically, soil erosion potential may be greatest during the time it takes for vegetation to become reestablished on disturbed sites.

172. Refer to Chapter IV, Agricultural Lands for definition of agricultural lands, cropland, rangeland, and woodland.

173. Impacts to transportation, including employee transportation, are discussed in greater detail under Chapter IV, Transportation.

174. This proposed action, offering one or two additional tracts under the prototype program, is consistent with the Management Framework Plan (MFP) for the White River Resource Area, as stated in Chapter I, Relationship to Other Documents, (3). The Resource Management Plan for the Piceance Basin, currently being prepared, will identify areas for future long-term, commercial oil shale development, and will supercede the MFP decisions for the Piceance Basin.

175. The herbage production levels used in the text appear significantly greater than the data based on C-a and C-b studies. Close examination shows both C-a and C-b figures are for forage production, whereas the EIS figures are for herbage production. This is the apparent reason for the variance.

176. Mine voids could be filled to full height if the mined areas are developed on a slight slope similar to that of the once proposed Superior mine design. Mine workings used as haulage ways would only temporarily be kept from backfilling operations. Concerning the economics of backfilling, refer to response 93. This leaves only the expansion factor which would require surface disposal.

177. Concerning leaching of commercial volumes of spent shale to reduce pH, the reader is directed to the last sentence of the paragraph in question. Capillary barriers are also discussed in Chapter IV, Surface Reclamation, "Aboveground Shale Disposal".

178. As stated in the text the reduction of the surface disturbance is dependent upon "the sequencing" of final retorting, mine facility withdrawal and the stockpiling of spent shale for a short period of time while the facilities are being decommissioned.

179. On page two of the Multi Mineral Mine Plan it states the "mining horizon" (Love bed) consists of a sequences of bedded nahcolite and nahcolitic oil shale. On page 41, second paragraph of the same mine plan, the Love bed is described as "not a single zone" but five individual nahcolite seams interstratified with four beds of nahcolitic oil shale. Therefore, they are referred to as several zones in this EIS.

180. The source and quantities of soil like material to be used in reclamation is described in Chapter IV, Surface Reclamation, "Aboveground Shale Disposal". Loss of 50 percent of the soil material is based on a worst case analysis and the estimated erosion rates of those soils. Concerning the slopes of spent shale for disposal no mention is made of their slope design in this section. Please read Chapter IV, Surface Reclamation, "Location of Shale Disposal Piles".

181. The reader is referred to Chapter IV, Hydrology, "Mine Dewatering" for an explanation of Figure IV-8.

182. Employee busing is stated as an assumption in Chapter IV, Transportation.

183. Estimates were derived using methodology described by Lyon (1979) for determining loss of effective habitat. This process did not involve statistical analysis and therefore no confidence limits were established.

184. Table IV-7 is the first place in the text where this information is presented. Footnote 1 explains that not all of the acreage would be impacted or would be out of production at any one time.

185. Oil Shale Lease Environmental Stipulation Section 4 (B) mandates the development of a habitat management plan which is essentially identical to the referenced Green River - Hams Fork wildlife stipulation.

186. The criteria for establishing a minimum acceptable bid were published for public review and comment in the Federal Register on October 20, 1982.

187. Irrigation is an established reclamation procedure, especially if reclamation is to take place directly on spent shale. However, your comment is valid in that longer term studies are needed to confirm this is a good method to use, especially for various retort methods and its effects on the spent shale.

188. Depending on the disposal pile design, lower zones of the pile may receive the same compactive effort as the final surface of the pile. If this is the case then the lower zones may be consolidated to the same extent as the

surface resulting in a relatively consistent permeability. However, pile design will be established at the time the Detailed Development Plan is accepted and finalized as a result of the design studies that would be conducted on the first few commercial scale disposal piles created by an oil shale facility.

Concerning evapotranspiration, appropriate changes have been made to the text.

189. In Chapter IV, Surface Reclamation, the fourth paragraph under the "Aboveground Shale Disposal" states that capillary barriers have only been conducted on small test plots over a short time period which may not adequately reflect long-term environmental conditions.

190. Because it is not known what practices would actually be taken by Tract C-a and C-b to dispose of excess dewatering water, a worst case analysis was made. The impacts to Yellow Creek agree with the analysis done by Tract C-a.

191. The mitigation measure you suggest is discussed in Chapter IV, Surface Reclamation and Solid Waste Disposal.

192. The firearm and employee transportation measures listed as uncommitted mitigation have been incorporated as lease stipulations. However, BLM can not require, only recommend that a company participates in an industrial association. Therefore, this will remain as uncommitted mitigation.

193. Consultation with the SHPO on the eligibility of the cultural resource sites located on Tracts C-11 and C-18 has been undertaken and is currently in progress.

194. A copy of the Gilbert/Commonwealth study is available from the BLM office in Meeker at your request and will be sent to you after the report has been formally accepted by the BLM.

195. Section 6, Part A(1) of the Environmental Stipulations of the lease states, in part, that "Before undertaking any activities that may disturb the surface of the leased lands, the lessee shall conduct a cultural resource field inventory in a manner specified by the Mining Supervisor on portions of the area that may be adversely affected by lease-related activities and which were not previously inventoried".

196. Comparisons of TAPAS modeling results to EPA guideline model results have been performed and are presented in the supplemental impact analysis technical report (Dietrich et al. 1982b). The BLM and the U.S. Forest Service have been cooperatively developing the TAPAS modeling system for routine analysis of potential air quality impacts in applicable situations for several years. Several presentations have been made in technical forums outlining the approach and progress towards implementation. Regarding the prototype analysis, a technical review meeting was held April 29, 1982 where the modeling approach was detailed to representatives of State and Federal regulatory agencies and other land management agencies. No objections were received at that time.

It is presumptuous to guess whether regulatory agencies would utilize TAPAS in their impact analyses, but in one specific application, the EPA has given preliminary approval to use a similar model (MESOPUFF) for evaluating PSD permit applications. The application of non-guideline models for PSD permit evaluations must be approved by the EPA on a case specific basis. Internally, EPA personnel have been examining the application of guideline models with modeled wind field trajectories.

197. Conditional water rights may or may not be developed in the future. Whether or not development of these conditional water rights will ever take place will depend upon many variables, the analysis of which is far beyond the scope of this EIS. The economics of the industry may dictate that none of the conditional rights be developed, or all the wells but one. The situation increases in complexity when all the other variables affecting the development of conditional rights are considered.

198. A description and the location of the Public Water Reserves on the tracts is included in Chapter III, Existing Rights. Specific locations of springs, wells and public water reserves are not required for the modeling analysis.

199. The 1951 base period is the hydrologic time period which is being used by the U.S. Bureau of Reclamation in their modeling efforts to simulate a normal hydrologic period. See the reference (Bureau of Reclamation 1981) cited in this text for further information.

200. The following assumptions were used for the proposed lease tracts:

Primary Employment	One Tract		Both Tracts	
	Construction	Operation	Construction	Operation
Low Scenario				
1988	1,700	188	3,400	376
1993	0	1,125	0	2,250
High Scenario				
1988	2,200	233	4,400	466
1993	0	1,400	0	2,800

As can be seen, the projection for both tracts double that for a single tract. Differences between Tracts C-11 and C-18 in the text arise from the sodium operation on part of C-18 which is assumed to continue if that tract were not leased.

Secondary employment estimates were obtained from the PAS model runs.

Community Allocations (percent)			
	Construction	Operation	Secondary (Pct. of County)
Glenwood-Carbondale	0	0	18
New Castle-Silt	3	2.7	0
Parachute-Battlement Mesa	2	1.8	0
Rifle	55	50.0	82
Grand Junction	0	7.3	100
Meeker	33	30.9	81
Rangely	7	7.3	19

The same allocation was used for all tract combinations and scenarios. As noted above, primary allocations were based on data for the other oil shale projects. Secondary allocations were based on retail sales data and tract locations.

Garfield, Mesa, and Rio Blanco Counties compose the impacted area, and include the communities of Carbondale, Glenwood Springs, New Castle, Silt, Rifle, Parachute, Battlement Mesa, Grand Junction, Meeker, and Rangely. Rifle and Meeker would be most heavily impacted by the proposed leasing, and some sections of the report may concentrate on them. See the table above for community allocation proportions.

The criterion for establishing the limits of expected social impacts was the population distribution predicted by the model uses. Those communities expected to gain population were included in Chapter III, Social. This point has been clarified by a minor wording change in the text. Seven communities were predicted to draw population.

The "inconsistencies" noted by the commenter grow out of the fact that different alternatives were being discussed in each case, and only those communities pertinent to each alternative are addressed, from the total potential group of seven.

Economic impact rankings were based on population and employment growth as compared to the baseline (No Action Alternative). As stated in Chapter IV, Economics, these were not related to a fixed set of percentage standards.

Impacts on community facilities and services were not estimated in the Draft

EIS, because sufficient data had not been acquired, but that data is now available and those estimates have been included in the Final EIS.

201. Admittedly, there is a wide diversity of opinion on the proper methodology for preparing an environmental impact statement. Where possible throughout the document, impacts were quantified and the significance judged based on the importance they should play for the decision-maker in reaching a final decision. In any case, guidelines developed by the Council on Environmental Quality in implementing NEPA were the major source of guidance for the EIS team. Where desirable or practical, additional clarifying methods were used to present the information. The important thing is that the EIS is successful in presenting to the decision-maker and the public the effects on the environment of implementing each alternative. The commenter concedes that this document has met this goal, stating "the impacts for each alternative were easily understood".

202. Factors used to evaluate significance of agricultural land impacts were: (1) quality of lands impacted, (2) acreage impacted, (3) percentage of county impacted, (4) distribution of impacts, and (5) recommendations from Colorado Department of Agriculture.

203. For the purposes of worst case analysis, it was assumed that the most productive forage lands would be impacted. This was done so that all possible impacts would be discussed. However, the amount, type and timing of impacts would differ by development scenario. This is shown in tabular form in Chapter IV, Vegetation, in both the "Vegetative Types" section and the "Grazing" section, and explained in the "Grazing" section narrative. While

different specialists don't agree on all aspects of revegetation, it is felt that this subject was discussed adequately. The assumptions made in Chapter IV, Vegetation, "Grazing" on water table drawdown are consistent with those made in Chapter IV, Hydrology, "Groundwater Quantity - Impacts to Existing Sources".

204. Data and methodology is not available to further quantify secondary off-tract impacts from recreational activities.

205. The methodology used to describe the existing visual resource is not outdated. The visual resource inventory was conducted according to current BLM Visual Resource Management procedures. However, the description in Chapter III was incomplete as the Management Classes were not included. The text in both Chapters III and IV has been changed accordingly.

206. The front end investment is determined by the magnitude and timing of the initial costs of production. In the case of removing 1000 feet of overburden prior to production of any oil shale, the "front end investment" would be prohibitively high given current and foreseeable future economic conditions. These economic facts, coupled with current laws limiting the size of lease tracts effectively preclude surface mining of deeply buried deposits having favorable stripping ratios.

207. Leaving an uncompacted, but leached upper three to four feet of spent shale may be conducive to plant growth in addition to a topsoil mantle. No studies have been done on this type of design. However, a conclusion could be made that this layer would require intensive fertilization and leaching (to be

conducive to plant root growth) similar to that of revegetation efforts directly on spent shale. Whether leaching of spent shale prior to placement is impractical or not is a matter of opinion and long-term waste control designs.

208. In arid regions of the west rarely is there a situation where soil formation under natural conditions is greater than soil erosion. "Erosion is a natural process. Thus soil cover or spent shale modified for plant growth will eventually erode, particularly from steep upper slopes. This eventuality must be considered and addressed in future waste stabilization research and planning" (Harbert and Berg 1978). The factors listed could possibly reduce soil erosion rates, but not prevent exposure of spent shale over the long-term.

209. The subject clause has been deleted from the preamble of the lease.

210. This is within the discretionary authority of the Secretary of Interior.

211. Three years for preparation of the Detailed Development Plan has not proven to be burdensome or unrealistic for the first prototype lessees. Based on this past experience, this should not prove to be a problem for any future prototype lessees.

212. Actions on public lands outside the lease boundaries are subject to the BLM permitting process that would require a Class III cultural resource inventory on all areas of disturbance located on public surface.

213. The referenced stipulation does not say that daily movement patterns of fauna must be documented. The stipulation states that fauna studies will determine daily and seasonal movement patterns. This does not require "daily year round fauna monitoring" as the commenter suggests.

214. Due to the preliminary nature of the proposed action, near source air quality impact analysis is inappropriate. General consideration of relative impacts between both tracts can be made qualitatively; but quantitative analysis without site specific input information (i.e., site location, mining and retort processes, control technology, local meteorologic inventory, etc.), would be meaningless. Detailed near source impact analysis would be required in a subsequent evaluation of the detailed development plan if a lease is issued. For the same reason, a long-range transport/regional bias was intentional in the worst-case analysis performed.

215. The Final EIS presents estimates of the acid deposition pattern over the Flat Tops and Mount Zirkel Wilderness Areas. The appropriate ratio between 24-hour worst-case and annual deposition is a matter of speculation since no credible data is available in this region. Monitoring is being conducted which will help establish such data. Ranges of predicted values are presented based on the worst-case 20 percent and an eight percent estimate, which is detailed in the supplemental impact analysis technical report (Dietrich et al. 1982b).

216. Percentages shown in Tables IV-19 and IV-20 are based on population numbers in Appendix B, Tables B-1 to B-5. Heading for Table IV-19 has been

modified to call attention to this fact. Employment, income, housing, agricultural and community revenue impacts are given in Tables IV-21 through IV-24.

Magnitude of social impacts are "quantified" at top of Table IV-20 so that readers know precisely how the terms were defined by the author, but the attachment of percentages to level of predicted "severity" is judgemental and readers are free to distribute percentages differently.

Commenter's remark about the use of "anecdotal" data is confusing. The text statement regarding professional planners is illustrative of the trend, not anecdotal.

217. Compaction is only a part of a waste disposal system and is not intended to be the only design criteria. That is why other sections dealing with retort conditions, location of spent shale piles, cementation, alkalinity, and toxicity are discussed. Also included in the text are "unique properties of retorted shale" which need to be considered in the design of spent shale wastes.

218. One hundred percent compaction is supported by Bloomfield and Stewart (1981) in both field tests and laboratory tests. Field test utilized conventional equipment to compact 8 and 12 inch loss layers of spent shale successively and obtained as much as 108 percent of laboratory compaction. Parameters such as permeability, seepage, leachates and stability are derived mostly from their laboratory tests.

219. Due to the level of saturation and the location of a spent shale disposal pile, internal drains, check dams and lined basins may become necessary to catch initial leachates (if any) from the pile. These types of structures are available for use (requirement) through the lease stipulations until it is proven they are not necessary to prevent an undesirable rate of release of leachates into the natural environment. Clarification has been added to the text.

220. Although carbonized shales can be treated to allow for vegetative growth, it is felt that there will be a continual problem with toxic elements being either leached or taken up in the plant growth that is established, specifically boron and fluorine. To say there would be no problems with carbonized shales if proper treatment occurs would be misleading.

221. It is difficult to compare model results with the dewatering results done at C-b to analyze changes in TDS for the following reasons:

1. The model predicted pumping rates of 15 cubic feet per second, five times that of C-b.

2. The model predicted TDS levels after 30 years and with no reinjection.

C-b has been pumping for only three years and has done reinjection in March of 1981.

In addition there was only one water quality sample taken in 1981 because of reinjection. The 1980 results indicated that there wasn't a linear trend in TDS, but there was a negative trend from wells WY-61 and WY-62 for specific conductance.

222. Section 1(C)(2)(b) of the lease does not say that deep aquifer wells are necessary for raw or spent shale disposal sites. Depths and location of the monitoring wells are to be specified by the Mining Supervisor.

223. Legislative mandates require BLM to analyze potential impacts on air quality from proposed alternatives, and to identify preferred alternatives based on an interdisciplinary assessment of anticipated impacts.

These requirements will continue to compel lessees to conduct their operations in full compliance with all laws, including air pollution regulations. In situations where exceedance of air quality standards have been predicted, and it is reasonable to believe the situation can be mitigated to comply with quality regulations, potential lessees would be informed of the situation and leases may be issued. The options identified by the commenter should then be considered by the lessee and the appropriate regulatory agency.

224. The discussion of cumulative impacts was done for both surface and groundwater in the Draft EIS. The cumulative impacts resulting from discharges similar to that from C-b should not be allowed to occur and are controlled by the State through the issuance of NPDES permits.

225. We assume that the commenter is referring to C-a and C-b, not U-a and U-b. U-a and U-b are in the early phase of construction. The performance history of both C-a and C-b were examined and discussed in the Draft EIS. Reinjection comparisons are not valid because of the very different groundwater systems; C-a and C-b are located near areas of recharge, whereas

C-11 and C-18 are near areas of discharge. The proximity to the stream channels of both C-11 and C-18 are different than C-a and C-b. Regulation of surface water discharges are done by the state through issuance of NPDES permits.

226. Again, it is assumed that the commenter is referring to C-a and C-b rather than U-a and U-b. The entire document, the lease and environmental stipulations have considered past experiences on the existing prototype leases.

227. Chapter III, the Affected Environment, describes the resources and geographic area where significant impacts can be predicted. Where the impacts are not felt to be significant, or where they are too dispersed to be predicted, they have not been addressed in detail.

228. Researchers on boom town growth vary widely on their estimates of severity of social impacts associated with that growth. Judgments generally range from 5 to 15 percent annual growth as the point where "severe" impacts begin to occur. We have been more conservative than usual in this EIS because all the affected communities will presumably already have experienced enough growth that individuals, social structures, and attitudes will have reached a fairly high level of preparedness.

Suggestions for mitigation funding are contained in the section in Chapter IV having to do with mitigations not legally required by BLM.

229. According to an official to the Rangely School District, as of October 7, 1982, there existed an excess capacity in the elementary school (K-5) of 80, and in the high school (9-12) of 150-175. The junior high was overcrowded with some use of temporary facilities required. A new junior high school is under construction.

230. The advisory groups mentioned are "official". Both Rio Blanco and Garfield Counties have Human Services Councils made up of representatives from the various social service delivery systems, including social welfare, colleges, mental health, handicapped, elderly, education, and other organizations. In addition there is a Human Resources Council for the whole western slope which meets periodically. Rio Blanco County also has an Advisory Council (divided into east and west for Meeker and Rangely) which was set up by the County and which includes representatives from all four levels of government, business and industry, churches, schools, etc., and whose regular meetings are open to the public. All of these groups are concerned with social and economic impacts of energy development, funding sources and decisions, assessment of needs, and establishment of priorities.

Federal budget cuts have removed any possibility that surveys of the sort the commenter refers to could be done; and personnel to do them are not available. Nor does the Office of Management and Budget (OMB) permit social surveys by Federal employees except under very stringent controls.

231. It is not possible to quantify (in terms of head counts) or specify just which persons would "win" or "lose" during the boom and restabilization period. The text attempts to spell out the kinds of persons, and the types of

gains and losses they would most likely experience in the human sense (based on empirical evidence). It also lists sources of fluctuations in severity of these elements.

These negative and positive social (and economic) impacts, and the trade-offs among them, are considered -- along with the negative and positive factors in the various other environmental resource elements -- in the decision for which this EIS is prepared.

232. Colorado's water is governed by a pure appropriation system. If an oil company has a water right on a particular amount of water that water is theirs, just as the agricultural user who owns a water right. In the event of a National Emergency, the Congress of the United States, under the supremacy clause can do what they feel is best.

233. The guarantee made by Arco to the farmers in Paonia is voluntary. Existing water right holders within the Piceance Basin are protected under Colorado State Law.

234. BLM has no legal power to require completion of projects on leased Federal land, except to terminate leases that are not carried out in accordance with the diligent development provision. The uncertainty inherent in future markets would make such a requirement economically infeasible and legally unenforceable.

235. Coordination with county and city governments is recommended in this EIS. Land use plans implemented by these agencies can be developed to

minimize impact to farm lands, grazing lands, and agricultural lands from urban development.

236. The commenter is referred to Section 12(d) of the Prototype Oil Shale Lease, and Section 9(A) of the Environmental Stipulations of the lease. In addition, several protections are included in the Environmental Stipulations of the lease for groundwater contamination.

237. Rapid growth in a local area usually aggravates local inflation in housing, retail goods, and services by creating a sudden increase in demand. However, it can also have the opposite effect by encouraging new competitors to enter the market. Because statistics are not collected on inflation rates in small communities, there cannot be any quantitative projections made of such impacts and can only state, as in the Draft EIS, that they would be likely to occur.

An addition has been made to the text to clarify the point about vulnerable groups in the population.

238. Although estimates of the actual amounts of additional property and severance tax revenues are not presently possible, oil shale development would certainly generate them. Additional revenues would accrue to the federal government through royalty and bonus payments, the state government through severance taxes, and local governments through property and sales taxes -- both direct and induced -- and returned portions of the first two. However, boom town experience in Colorado and elsewhere has shown that the capital improvement costs required by large population growth greatly exceed the

additions to local revenues, particularly in the early years of growth when the improvements must be built.

239. The boundaries of the net energy analysis were drawn to exclude resources left in the ground. The rationale for this methodology is that we are attempting to describe, in a quantitative manner, the energy needed to produce another energy, oil shale. The purpose of the analysis was to determine, by type and quantity, what direct and indirect energy sources must be devoted to oil shale production. Therefore, the resources left in the ground were not taken into consideration because they are not energy used to produce oil shale.

240. It is not within the authority of the Department of the Interior to establish electricity rates.

241. The Draft EIS states that electricity has less utility, as an energy type, than does oil. This statement was made to indicate the differences in energy qualities. Electricity may be considered a premium energy by some because of its economic and environmental costs. However, energy analysts consider oil to be a higher quality energy form because it is more easily transported and stored than electricity and it also has more utility.

The Draft EIS also stated that it was unclear whether or not excess generating capacity was available within the Western Area Power Administration region. However, even if there is no excess generating capacity, the Deseret Generation and Transmission (Moon Lake Power Plant) could opt to build a second generating unit to furnish power for the oil shale industry. Moon Lake

Power Plant has already had an EIS written for it -- May 1981, BLM/REA. REA has stated that they will require further environmental analysis if and when a second unit is required. A second potential source for electricity is Colorado Ute's proposed Southwest Generating Station.

It should be noted here that any new generating station getting loans from REA or rights-of-way from BLM will be required to have an environmental analysis completed before grants are issued. The concerns you list in the comment would be addressed in the analyses.

242. Both the Colorado Department of Health and the State Department of Agriculture have studied the effect of conversion of agricultural land from urban development. Daily Sentinel reporters have recently performed literature reviews and information searches to base newspaper articles documenting this impact in Mesa County. Also, refer to Chapter IV, Agricultural Lands for discussion of impacts estimated for urban development on croplands associated with this project.

243. The specific impacts to ground and surface waters cannot be fully analyzed until a Detail Development Plan is submitted (after the tract is leased). At that time, a specific multi minerals process would be proposed and would be analyzed for impacts to surface and groundwaters.

244. Water for stock ponds is primarily derived from snow melt or excess runoff from thunderstorms and will not be affected by groundwater pumping. The Draft EIS further states that wells and springs within the area identified in Figure IV-9 should be monitored for impacts, and that mitigation for lost sources will be done. The text has been clarified as appropriate.

245. The Draft EIS states that water might have to be treated for domestic or stock use in the long-term. It further goes on to present mitigating measures to reduce groundwater quality impacts. Because impacts may not show up for hundreds of years, a monitoring program is recommended.

246. Most streams within the state are over appropriated, thus the state requires an augmentation plan for any major water diverted by a junior appropriator to protect senior water right holders.

247. Due to the preliminary nature of a draft analysis, it is not appropriate to compare predicted pollutant concentration values until a final EIS is prepared. There are no longer any large discrepancies with other modeling studies due to improvements in the modeling approach utilized for the Prototype Final EIS, but whenever different modeling approaches or varying assumptions are applied, there will be a variation between reported results. Modeling approaches and assumptions are made on a case-by-case basis, reflecting varying levels of available information and/or the state-of-the-art of the models applied. A comparison of the final results for the studies mentioned above indicates nearly identical results within the limitations of varying modeling approaches and assumptions applied. A detailed analysis of these differences is available upon request from the BLM Air Quality Specialists in Colorado and Utah.

248. The BLM has no "second thoughts" about the modeling approach utilized to predict air quality impacts associated with alternatives for leasing additional prototype oil shale tracts. The modeling selection and application

criteria are elaborated at length in the impact analysis technical report (Dietrich et al. 1982a), and summarized below. The air quality analysis presented in the EIS was performed to satisfy requirements of NEPA. It should not be interpreted in a regulatory sense and would not satisfy the requirements of the regulatory process under the Clean Air Act.

Since there is no EPA approved/verified air quality model applicable for analysis in complex terrain or on a regional scale (as encountered in Western Colorado), a modeling approach was selected which applied best scientific and professional judgment to make adequate assessments within limitations of available information. TAPAS was selected because: it is applicable in complex terrain; it can model multiple emission sources; it utilizes terrain induced pollutant trajectories; it is suitable for the regional scale (50-200 km transport distances); it is applicable for worst-case analysis; and similar versions of the models have been applied by regulatory agencies in specific situations (47 FR 42806).

Because best modeling approaches must be selected on a case-by-case basis, and atmospheric dispersion modeling is an evolving art, it is unreasonable to expect one model to be applicable for all of BLM's needs.

249. Long-term dissolved solids concentrations may increase. It is difficult at this time to ascertain the long-term effects due to the unknown extent of actual aquifer fracturing in the lease tract areas, the rate of release of solids from the mine areas, and the amount of dilution dissolved solids would undergo prior to reaching surface streams. Please refer to Chapter IV, Hydrology, "Groundwater Quality", section on "Leachates of Subsurface Retort Chambers" concerning the rate of leachate transport.

250. Solution mining in the saline zone would have to be developed to leave a sufficient boundary layer between the bottom of the lower aquifer and the solution cavity to prevent inflow or subsidence. Even if subsidence should occur, the effects upon groundwater flow is expected to be insignificant due to the fact that the Piceance Basin aquifer flow is fracture controlled.

251. Although there are clay lenses that provide impeded alluvial flow; the alluvial flows are assumed to be derived from the bedrock aquifers as used in the model for groundwater impacts. The commenter is referred to Taylor (1982) for further clarification of model assumptions.

252. The commenter is urged to read the beginning of Chapter IV, Hydrology concerning modeling results and Chapter II, C-11 Alternative section on "Hydrology" concerning water augmentation.

253. BLM's modeling results do not agree with the referenced report. If increased salt loads did occur, such high levels of salts would require mitigation (in essence treated) prior to release into the stream system. The text has not been changed.

